ol. 51 In 2 Parts—SEPTEMBER, 1942—Part One No. 3

CHEMICAL INDUSTRIES

The Chemical Business Magazine

TECHNOLOGY DEPT.

SOLVED—

the mystery of the fuming nitroglycerine

One of a series of cases from the files of Monsanto's Technical Service Department which show how skill, experience and ingenuity can solve many critical wartime production problems. For obvious reasons names have been omitted.

1. "There must be something wrong with that car of mixed acid you shipped our new plant. When we run a finished nitration batch into our drowning tank the stuff sends up clouds of dense, reddish fumes and almost boils over the sides of the tank. My men are so scared they're ready to quit—and the plant is practically shut down."

The customer, a manufacturer of nitroglycerine was worried!

2. That was 5 o'clock on a Friday afternoon. Immediately tests were re-run on the control sample from that particular batch of acid. The plant man who loaded the car was called from his dinner and questioned closely on the possibility of any contamination during loading or in the car. The acid was definitely cleared . . . but by 9:00 p. m. a Technical Service man was on his way to the customer's plant.

3. At the customer's plant every possible check was made—on the water supply, even on the thermometer used to control temperatures in the drowning tank. Finally, a sample batch of nitroglycerine was run into the tank—and the mystery was solved.

Like the rest of the plant, the tank was new. Resin from the yellow pine staves with which it was built, was reacting with spent acid. As the wood aged, the fumes would subside . . . the plant resumed production.

4. When Monsanto Technical Service men investigate a complaint, they search for more than an acquittal for the product involved. They aim at *a solution of your problem.* And two factors often give them a head start: (1) an understanding of *your* basic processes; (2) a broad knowledge of their own business which springs from the very breadth and variety of Monsanto's chemical experience. For their help, inquire: MONSANTO CHEMICAL COMPANY, St. Louis.

"E" FOR EXCELLENCE—The joint Army-Navy "E" burgee, "representing recognition by both the Army and the Navy of especially meritorious production of war materials," has been awarded to Monsanto and now replaces the Navy "E" first awarded Monsanto December 31, 1941.

MONSANTO CHEMICALS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

Chlorine Fights with the Fleet!

America is the United Nations' production line! Down that production line [illegible] a constant number of materials—supplies for [illegible] our Army, our Air Force and our Allies. *Chlorine is helping produce them!*

SOLVAY SALES CORPORATION *Alkalies and Chemical Products Manufactured by The Solvay Process Comp*

Caustic Soda, important in processing cotton for tire cord, is now being used to dissolve the cotton from the rubber in the process of reclaiming scrap. Thus Caustic Soda completes its cycle of usefulness to the Textile and the Rubber Industry, both of which are important consumers of Westvaco Chemicals.

In addition to Caustic Soda, other Westvaco Chemicals serving the Rubber Industry are Seawater Magnesia, Blanc Fixe, Sulphur Mono-Chloride and Chlorinated Solvents.

At this time, we particularly invite inquiries on Westvaco Caustic Soda from rubber processors and reclaimers.

Westvaco CHEMICALS

WESTVACO CHLORINE PRODUCTS CORPORATION

405 LEXINGTON AVENUE • NEW YORK, N. Y.

The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

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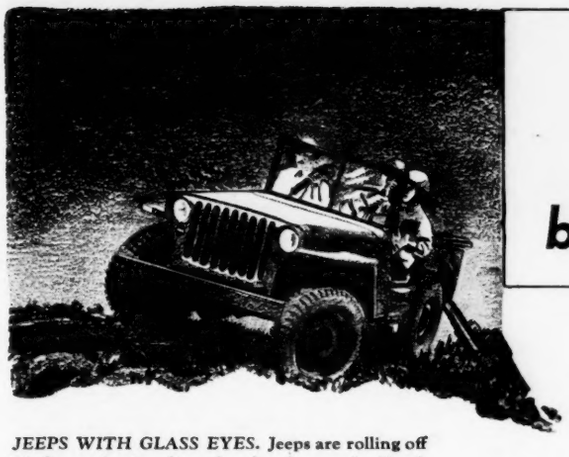
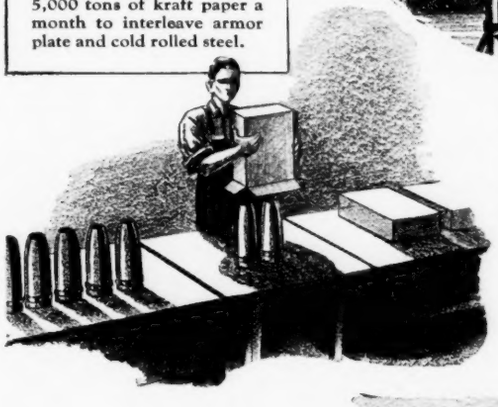
—an unseen power behind America's offensive!



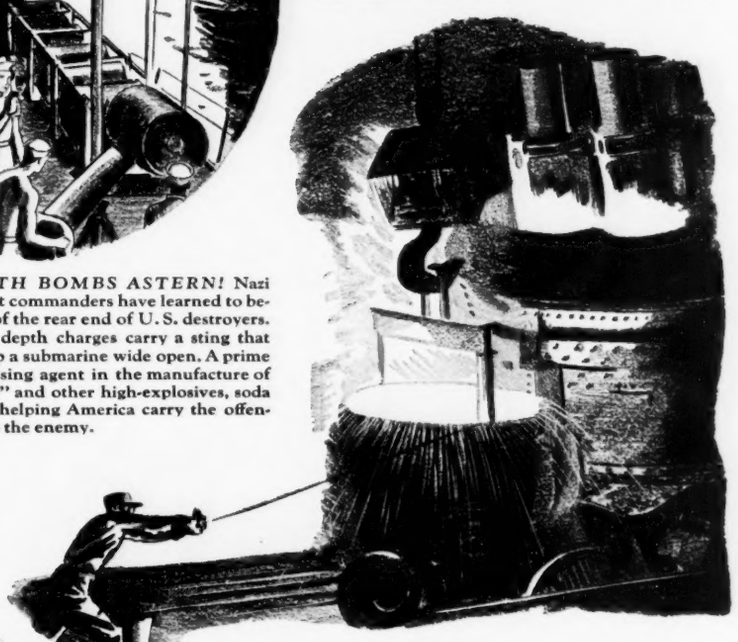
JEEPS WITH GLASS EYES. Jeeps are rolling off U. S. production lines by the thousands. Headlamps and bulletproof windshields are products of the glass maker. Largest single user of soda ash, the glass industry is also turning out greatly increased quantities of glass containers. This releases vital tin and steel for war production.

THE BEST-DRESSED ARMY IN THE WORLD—Wherever it goes—into the steaming jungles of the southwest Pacific or to the freezing shores of Iceland—the American army is clothed in the finest uniforms to be found on any battlefront. In processing millions of yards of cotton, rayon and woolen cloth for U. S. military uniforms, the textile industry uses thousands of tons of soda ash.

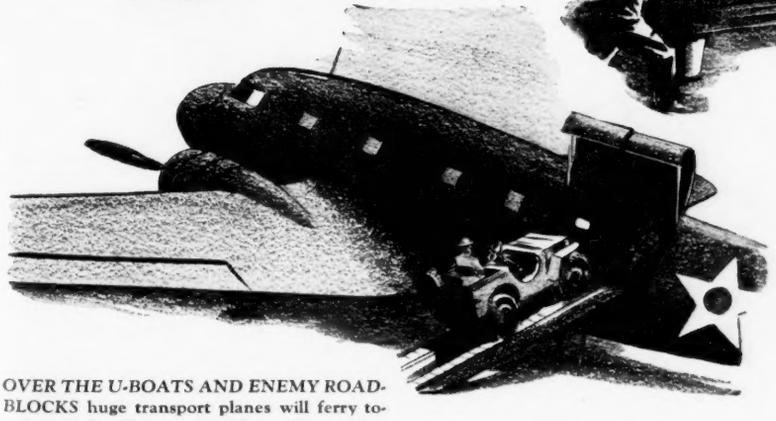
SHELLS FOR HARD-HITTING 75's move along conveyor belts to stapling machines where they are sealed in cartons for shipment. Ordnance plants alone use 30,000 tons of paper every month for packaging shells. A major consumer of soda ash, the paper industry also supplies steel mills with 5,000 tons of kraft paper a month to interleave armor plate and cold rolled steel.



DEPTH BOMBS ASTERN! Nazi U-boat commanders have learned to beware of the rear end of U. S. destroyers. Their depth charges carry a sting that can rip a submarine wide open. A prime processing agent in the manufacture of "TNT" and other high-explosives, soda ash is helping America carry the offensive to the enemy.



AN AMERICAN GIANT THE ENEMY FEARS. The U. S. iron and steel industry produces a greater tonnage of metal than all the Axis countries combined. In iron foundries and steel mills, soda ash plays an important role in the production of more and better iron and steel castings.



OVER THE U-BOATS AND ENEMY ROADBLOCKS huge transport planes will ferry tomorrow's lend-lease materials to distant allies hemmed in by fire and steel. In the production of aluminum, from which these cargo planes are being fabricated, soda ash is an important processing agent. It is used to treat the bauxite ore from which pure aluminum is derived.

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LIQUID CHLORINE...SODA ASH...CAUSTIC SODA...BICARBONATE OF SODA...BLEACHING POWDER...HTH PRODUCTS...AMMONIA, ANHYDROUS and AQUA...FUSED ALKALI PRODUCTS ...SYNTHETIC SALT CAKE...DRY ICE...CARBONIC GAS...SODIUM CHLORITE PRODUCTS

THE READER WRITES

General Aniline & Film's Problems

In the April edition of CHEMICAL INDUSTRIES you announced the reorganization of the formerly I. G. operated General Aniline & Film Corporation at the request of the U. S. Treasury and the appointment of a Board of Directors charged with the duty of operating the Corporation as an American concern. This Board is responsible to the Alien Property Custodian.

It may be of interest to your readers at this stage to know something of the scientific problems which confront those charged with this duty of reorganization.

Under the former management, as now appears, while the factories of the Corporation were efficiently staffed and operated, research and development activities in their broader aspects were retained in Germany under the control of the I. G. It becomes, therefore, one of the major tasks of the new management to create as quickly as conditions allow, an integrated research organization adequate to the immediate and future needs of the Corporation as an American enterprise. This is vital not only to insure maximum contribution by the Corporation to the war effort but to prepare foundations for continuing development after the war.

The General Aniline & Film Corporation controls, among other assets, a considerable number of U. S. Patents granted to the I. G., the contents and value of which are at present largely untested. These in themselves represent a portfolio of great potential industrial importance, as examination of only a few patents has already revealed. Many of these represent the latest products of I. G. research which have not hitherto been developed to useful ends. The scientific appraisal of these patents and the selection for early development of those which can immediately contribute to the war effort is in itself a considerable and urgent task.

It is unique in industrial history that research opportunities of such magnitude have been created by the fact of a large and efficient manufacturing organization being suddenly deprived of the scientific foundations necessary to its healthy progress and to its powers of new creation.

To rectify this is one of the urgent tasks now confronting the Directors and Officers of the Corporation, particularly of Dr. E. C. Williams, Chemical Director, and of Dr. W. F. Zimmerli, Vice President in charge of patents and research. It presents a challenge and an opportunity for service and accomplishment to a large number of experienced scientific workers and of those starting on their careers.

While public announcements regarding the Corporation have already led to many applications being received, it is the management's wish (in order that there may be no thought of improperly competing for men with other industries active in the war effort) that the nature and full scope of its needs be realized both by individual scientists and by company executives.

We hope that we can successfully establish in times of exceptional difficulty and with the wholehearted good will of other industries, the kind of research organization that is needed to perform the important tasks assigned to us. It is our purpose so to do.

ROBERT E. MCCONNELL,
President,
General Aniline & Film Corporation,
New York, N. Y.

●

Priorities
Allocations
Price Controls

●

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

Handling Paper Bags

In the current issue of your magazine there appears, on page 269, an illustrated article on "How To Handle Paper Shipping Sacks — The Right Way — The Wrong Way."

Since we are handling a great many paper bags at the present time, we are, of course, interested in the proper handling, and think that this article brings very forcibly to the attention of the handlers of paper bags the correct handling methods.

We are very desirous of procuring about four or five dozen of these prints, but cannot find the address of the Paper Shipping Sack Manufacturers' Association, by whom this article was issued. Will you please give us this information?

E. R. STAMPS
General Superintendent
F. S. Royster Guano Company
Norfolk, Va.

Editorial Note: Others similarly interested should communicate with the Association at 370 Lexington Ave., New York, N. Y.

The Situation In Rubber

I thoroughly enjoyed reading "Between the Lines" in the August issue of Chemical Industries dealing with the situation in rubber, but I am still confused about the relative claims of various factions each accusing the other of obstruction in a period of grave national emergency. Don't you think you should have an article giving an impartial viewpoint for the readers of C. I.?

ARTHUR B. SMYTHE
Chicago, Ill.

Editorial Note: The editors believe this matter should be allowed to rest now in the capable hands of the Baruch Committee at least until such time as the Committtee issues a full report.

Calendar of Events

Sept. 17, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.

Sept. 17-18, International Association of Electrical Inspectors, (Northwestern Section), Portland, Oregon.

Sept. 21, Utah Paint, Varnish & Lacquer Assn. Monthly Meeting, Ambassador Hotel, Salt Lake City, Utah.

Sept. 28, Association of Consulting Chemists & Chemical Engineers, Inc. Council Meeting, The Chemists' Club, New York, N. Y.

Sept. 29, Victory Banquet—68th Annual Convention, National Wholesale Druggists Association, Waldorf-Astoria, New York, N. Y. Tickets $10.00. Reservations Percy C. Magnus, 16 Desbrosses St.

Sept. 29-Oct. 1, Technical Association of the Pulp and Paper Industry, Hotel Statler, Boston, Mass.

Sept. 29-Oct. 1, American Gas Association, Annual Meeting, San Francisco, Calif.

Oct. 1, Indianapolis Paint, Varnish & Lacquer Assoc. Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

Oct. 5-9, 31st National Safety Congress & Exposition of the National Safety Council, Stevens Hotel, Chicago, Ill.

Oct. 7, Maryland Section of American Institute of Chemical Engineers, General Meeting, Blackstone Hotel, Baltimore, Md.

Oct. 7, American Institute of Consulting Engineers, Luncheon & Council Meeting, City Midday Club, New York.

Oct. 7, The Electrochemical Society, Inc., Theory and Electrodeposition, Detroit, Mich.

Oct. 7-9, American Oil Chemists' Society, Drake Hotel, Chicago, Ill.

Oct. 7-9, Twenty-Ninth National Foreign Trade Convention, Hotel Statler, Boston, Mass.

Oct. 7-10, The Electrochemical Society, Fall Meeting, Hotel Statler, Detroit, Mich.

Oct. 12-14, American Institute of Mining and Metallurgical Engineers, Inc. Inst. of Metals and Iron & Steel Div., Book-Cadillac Hotel, Hotel, Detroit, Mich.

Oct. 12-16, National Metal Congress & Exposition, Detroit, Mich.

Oct. 15, New England Paint & Varnish Production Club, Hotel Vendome, Boston, Mass.

Oct. 15-16, Tanners' Council of America, Annual meeting, Palmer House, Chicago, Ill.

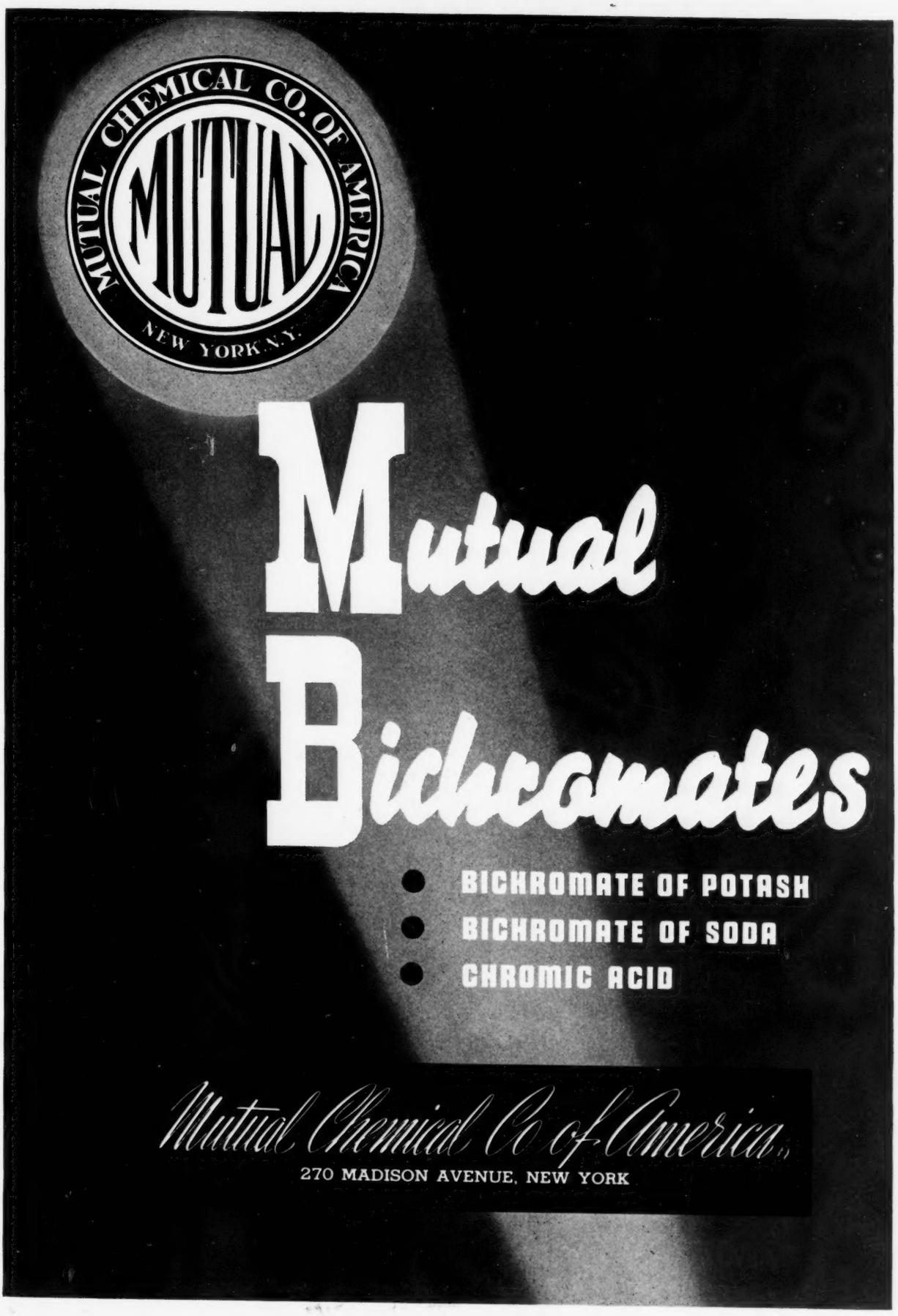
Oct. 26-28, National Lubricating Grease Institute, New Orleans, La.

Nov. 16-18, American Institute of Chemical Engineers, Netherlands Plaza Hotel, Cincinnati, Ohio.

Nov. 24-29, National Chemical Exposition and National Industrial Chemical Conference Sherman Hotel, Chicago, Ill.

Nov. 30-Dec. 4, American Society of Mechanical Engineers, New York, N. Y.

Feb. 15-18, 1943, American Institute of Mining & Metallurgical Engineers, Annual Meeting, New York, N. Y.


MUTUAL CHEMICAL CO. OF AMERICA
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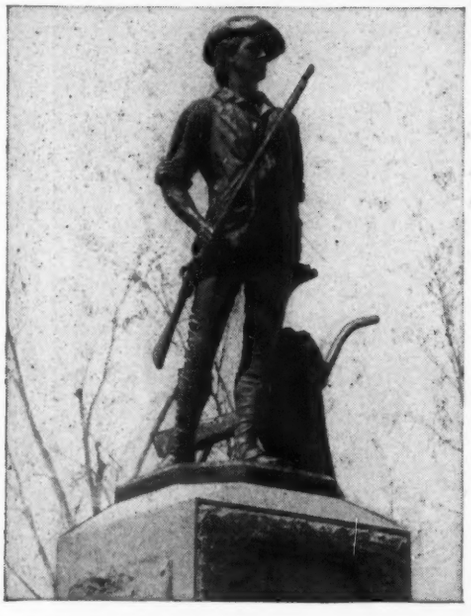
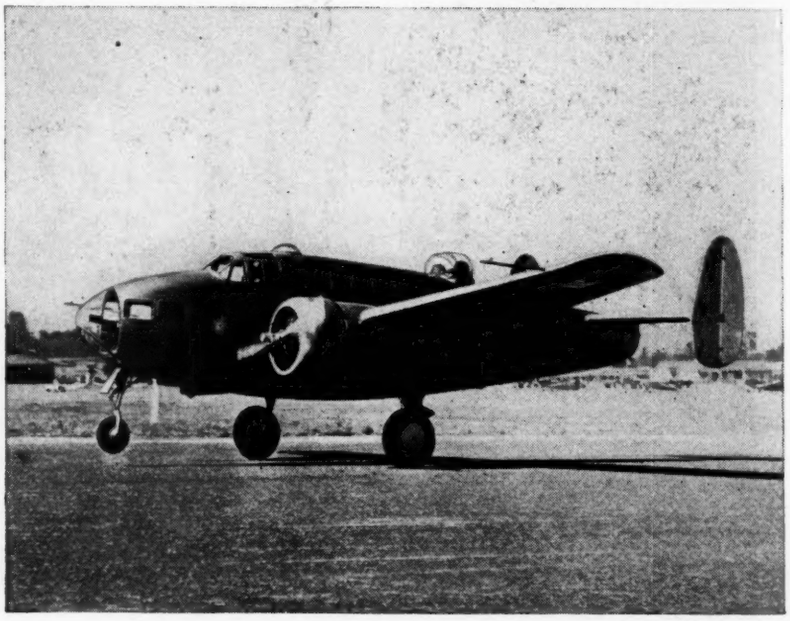
Life On The

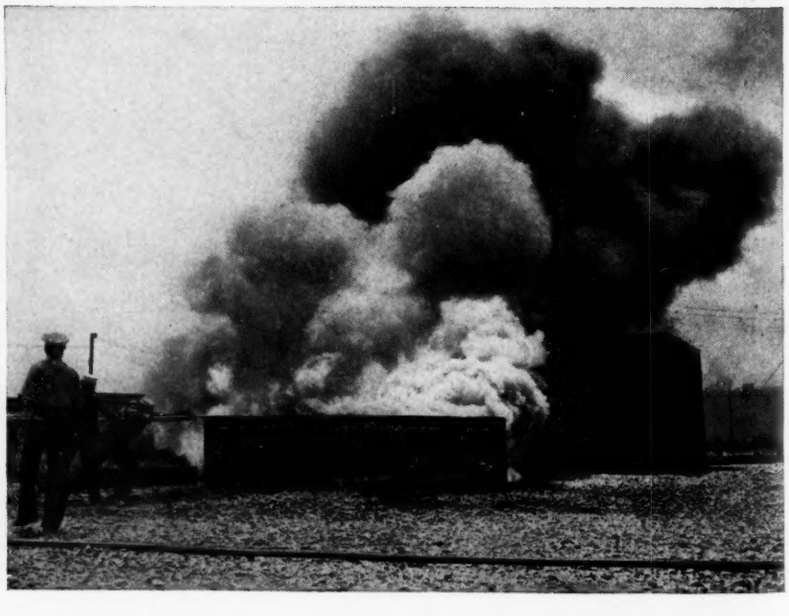


(*Above*) **FAMILIAR FIGURE** of the Minute Man sends forth a new call today—a call for every American to do his share in the nation's Victory program through the regular purchase of War Bonds and Stamps. America's armies are fighting on new and broader fronts; materials from America's factories are aiding the United Nations in many theatres of war; and every purchase of Bonds and Stamps helps to support the armies, to furnish the arms. Every American, in every walk of life, has the opportunity—and privilege—of aiding the cause of Victory by making every payday Bond Day.

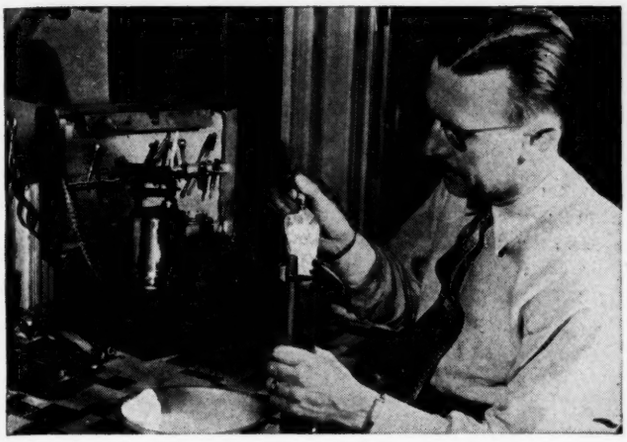
(*Below*) **PLYWOOD-AND-PLASTIC PLANES,** light, strong, and fast, are among the most striking achievements of aircraft designers. This new AT-13 bombing crew trainer, built by Fairchild Engine and Airplane Corporation, which produced the first all-molded plywood plane in 1937, is constructed almost entirely of wood veneers permanently bonded by synthetic resins and "molded" by special processes to the final shape. Large quantities of strategic metals can be conserved by this unique construction, and plane performance is improved, since the complete elimination of rivet heads or other exterior fastening increases aerodynamic efficiency and thus permits higher operating speeds. For permanent bonding of wood, fabric and paper, URAC** and MELMAC* Adhesives produced by Cyanamid are extensively used for aircraft construction and other applications.



(*Right*) **BLANKETS OF FOAM** offer a highly effective means of smothering stubborn fires, such as those originating in oil or other flammable liquids. Saponin, one of the newest additions to the list of Cyanamid's products for industry, is often used in foam type fire-extinguishing equipment, where its foam-forming characteristics contribute to the efficiency of the extinguishing agents. The unusual foaming, emulsifying, and detergent properties of Saponin are also of value in a wide variety of other applications. Saponin is currently available from Cyanamid in three forms, with special characteristics to meet the requirements of a wide range of uses: Commercial Pulp Saponin; Saponin Purified (Powder); and Saponin Extract Purified (Liquid). Samples for test purposes and analyses of the three grades are available from Cyanamid upon request on your business letterhead. It is desirable that requests for samples indicate amount of sample required, the form of Saponin used, and the purpose for which it is required, in order to enable Cyanamid to offer possible suggestions and recommendations for the most logical grade for the particular application. Write today, outlining your needs.



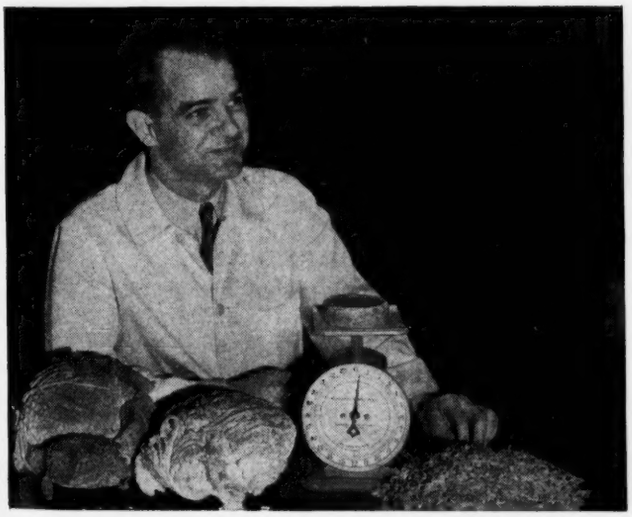
Chemical Newsfront



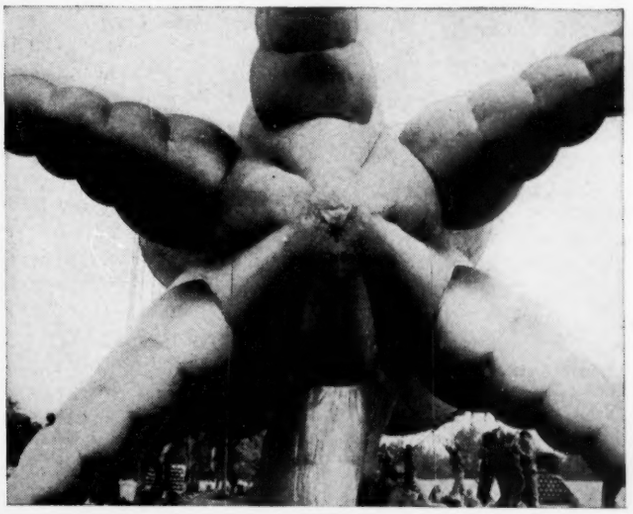
(*Above*) **DRY ICE SERVES AS "POWDER"** in this novel gun, shown being charged by Earl E. Paul, of the Monner Gun Corporation. After charging, the dry ice is liquefied by absorption of heat from the surroundings, and a small amount of the liquid is then released to a chamber behind the bullet. The expanding CO_2 gas from evaporation of the liquid fires the gun.

(*Above*) **FROM THE BARK OF A TREE** comes one of the newest textile fibers, which has its origin in the California redwood. As new synthetic fibers become increasingly important, Cyanamid's technical cooperation and research facilities are especially valuable in aiding the textile dyeing and finishing industry to solve new problems.

(*Below*) **FOOD DEHYDRATION,** a rapidly growing processing technique, aids in cutting weight and bulk for handling, shipment and storage. As preservation and packaging present new problems, the food industry turns to chemical research for their solution.



(*Below*) **BARRAGE BALLOONS** of rubber-covered fabric form an aerial bulwark for the protection of strategic points. Cyanamid's comprehensive line of rubber chemicals and assistance in their use aid the industry in the compounding of rubber for many wartime requirements.



American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

*Trade mark *Reg. U. S. Pat. Off.

WASHINGTON

By T. N. Sandifer

ALL the portents of another revamping of Washington's war-making machinery are evident in the National Capital, and it may well be, some new set of initials, some new overlapping agency, will be in being by the time this appears.

It will furnish some means of appraisal if it is stated now, in advance of such an event, that the general expectation here is that nothing world-shaking will result. At this stage most of the Capital is inclined to the view that a real down-to-earth war organization will come only after some major setback to American arms in the field. Only when this happens will the nation see another speedy move like the clean-up of the Office of Civilian Defense, which followed public infuriation at the spectacle of the goings-on in that agency while Bataan was in the balance.

T. N. Sandifer

Regardless of whether the change occurs soon, the fight between the ambitious element in the War Department and the War Production Board for virtual control of the national economy, as opposed to the current division of responsibility in production and material supplies, can be expected to continue until the issue is decided, probably by higher authority.

The bitterness toward so-called $1-a-year men in Washington still persists in some factions in Washington. There is more than a suspicion that some of these elements, nominally very hostile to the military, would side with the latter if it meant humbling the business group which up to now has on the whole, run the production machinery.

Most of these anti-business factions however, are obviously overlooking a long-range aspect to military control of production, which is that military men are not likely to dally with the labor element in the Administration or in the factories, very long. A much different story in this relation is expected by most Washington observers, in fact, if military control finally wins out. The one factor militating against victory over Nelson in this issue is to a large extent, a fear among some of the more astute Administration group that this might follow.

A secondary brake on the growing ascendancy of the military clique is a realistic recognition by a limited number around Congress and elsewhere, of the Army's tendency toward profligacy in asserting its needs. Some in the Capital recall that the Army wound up the other World War with something like a quarter-million leather saddles, among other items, which nobody could adequately explain having bought, beyond the reason that it just seemed like a good idea at the time.

Somebody around the War Department for example, is likely to get the conviction that the Army needs 10,000 brass-bound widgets, with platinum insets, and would insist to the last shot in the war that the Army just had to have them, unless a cold-blooded individual, who knew widgets, were there to suggest that they didn't need widgets at all; what they really wanted was 500 plastic gadgets with Osnaburg straps. And the chances would be, the cold-blooded individual could prove his point.

This is not to imply that the Washington type of soldier doesn't know his way around politically. He has to. There is no concealment of the military preference for drafting the younger, 18-19 year-olds, over the proposed culling of older married men and those previously rejected for physical short-comings. But a politically-sensitive Administration, needled perhaps from certain obvious quarters on sentimental grounds also, hesitates to encourage this draft. Hence it is a fair suspicion that most of the sounding-off about the forthcoming draft of older men, while a genuine threat, is also aimed at fostering the draft of younger, more pliant material. This can be exepcted as a first order of business—after election.

It is a fair observation on this point, too, that while the nation will have been at war a year this December, and the Army has been creating lieutenant generals at a phenomenal rate, as members of Congress are beginning to comment upon, the Army hasn't done any major fighting —always excepting the Army Air Corps, and the few of the Army left to their fate on Bataan. The single forward step in the war to date has been the Navy's.

The suspicion that all the ballyhoo about a forthcoming draft of older men, while genuine enough in its main implication, is also labored with some subtle primary purpose not generally discernible, is borne out in one respect. It is being widely pointed out in the Capital that the War Department has made only casual use of some 250,000 voluntary applications for uniformed ranks in special military services. These men are anxious to fill the positions in the service to which most of the prospective older drafteees presumably would have to be assigned because not physically qualified for active field duties. Thus there is room for a question which so far, the Army has not answered.

Chairman Nelson has asserted WPB's authority rather forcefully for the time-being, and the expectation now is that the Army will bide its time. An unfavorable military event can have some influence in this argument, also.

On the subject of draft legislation, the open intention to await the elections before doing anything definite, and the apparent plan to follow a similar line on revenue legislation, are of course, open to the charge of plain dishonesty with the public. The question is naturally asked of Washington, "If you think you are right, why not be courageous enough in the conviction to face the voters on it?" This is not the politician's way.

This is reflected in a marked slow-down of nearly all Washington activity at the moment, partly due to Congressional preoccupation with November results, and the general effect of the end of a season. Nevertheless, some activities on prices or other restrictions are of general interest.

Miscellaneous Orders

Prices have been stabilized by OPA on natural oils and concentrates from which Vitamin A is derived, at substantially lower levels than 1941, through MPR No. 203; the second specific price action in the vitamin field.

The cosmetics industry has been given more time, until September 15, to file data requested by OPA.

Dyestuffs users have been reminded by WPB that the amended Conservation

(*Continued on page 356*)

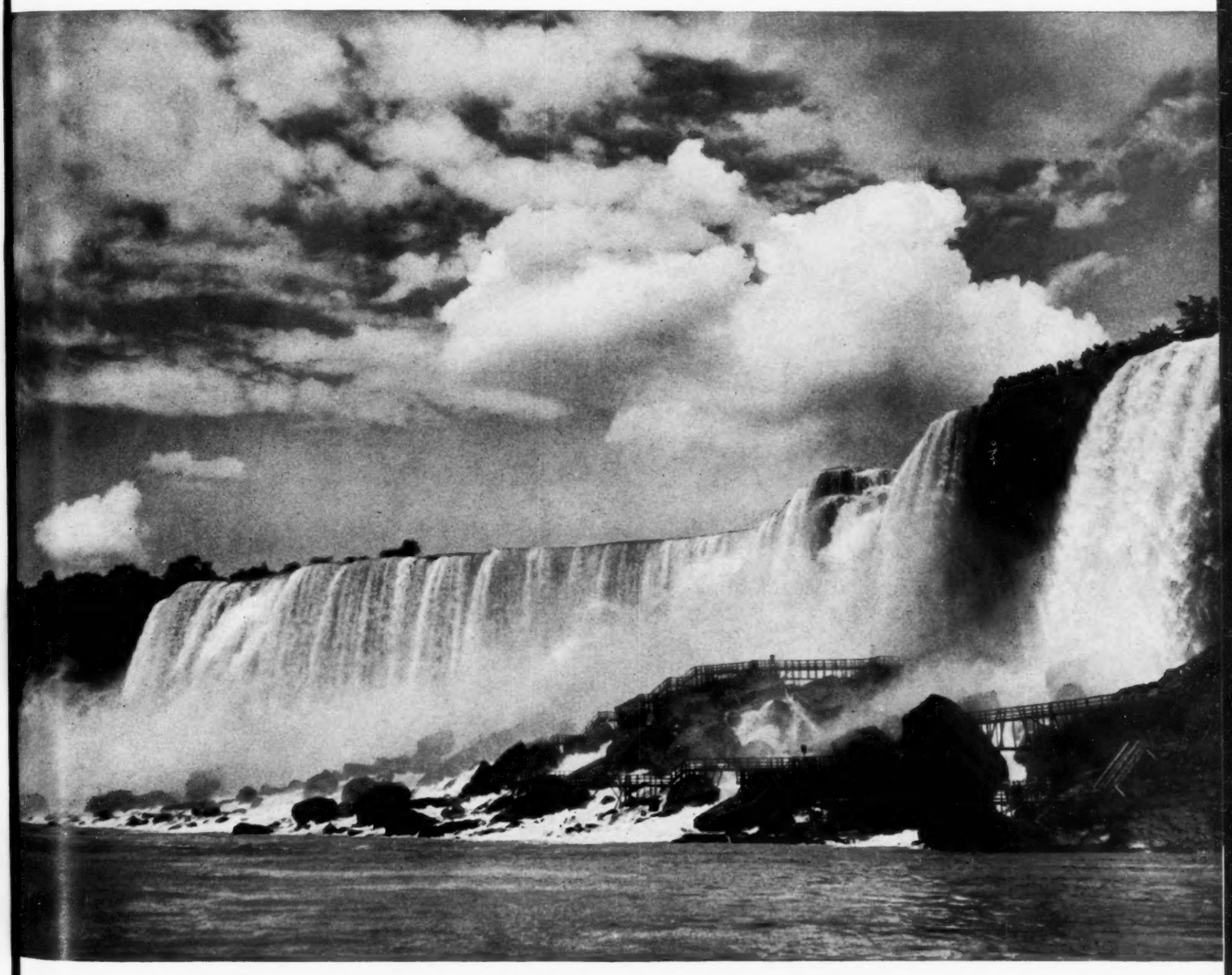
power to spare

For centuries Niagara Falls has inspired man with its ageless beauty and ceaseless power. Generation after generation has found it symbolic of the steadfast, dynamic way of life under which America has grown to its present stature. It is symbolic, too, that while power from Niagara has been harnessed to the will of man...to the production of mills and factories, to the creation of light and heat and energy...it still has a limitless volume of power to spare. Only a little of this great power has been used...as not all of the great potential power of America itself has been used.

America is a greater land of promise today than when the first pioneer saw a dream of the future in the mists of Niagara. New ways, new methods, new conceptions of how man may progress and expand under the doctrine of freedom can be seen today. The world will follow the steadfast, dynamic way of America to a new era. For the power of free men is as boundless as the power of Niagara — and as resistless as the flow of the river over its sharp cliffs.

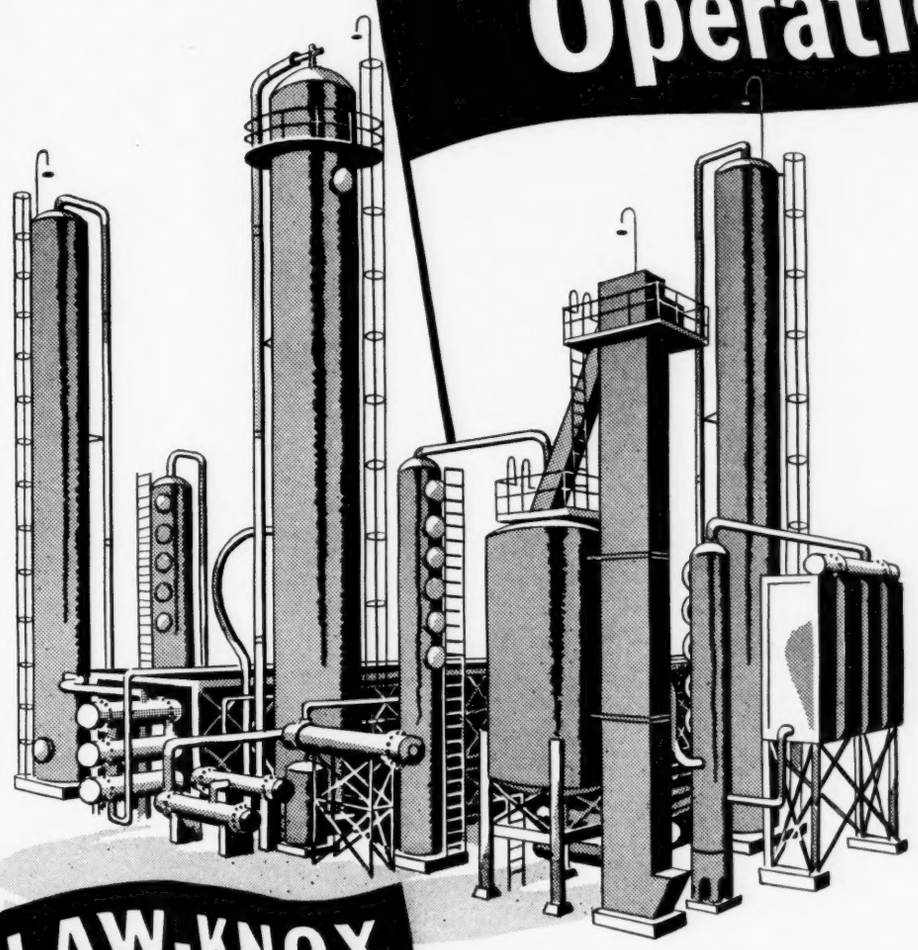
We who work within sight and sound of Niagara Falls are devoting every ounce of our energies and facilities to speeding the flow of chemicals for Victory.

CAUSTIC POTASH · CAUSTIC SODA
PARA · CARBONATE OF POTASH
LIQUID CHLORINE



EBG Niagara ALKALI COMPANY
60 EAST 42nd STREET, NEW YORK, N. Y.

From Idea to Operation



BLAW-KNOX builds complete Process Plants

Research, engineering, fabrication, erection, initial operation — all under one guarantee. Depend on Blaw-Knox unified control to do the whole job with maximum efficiency all the way.

BLAW-KNOX DIVISION OF BLAW-KNOX CO.

2093 FARMERS BANK BLDG., PITTSBURGH, PA.

Offices in Principal Cities

Complete plants or equipment for the following processes . . .

Distillation	Kilning and Calcining	Organic Synthesis
Gas Absorption		Emulsification
Solvent Extraction	Polymerizing	High Pressure Processing
Solvent Recovery	Evaporation	
Heat Transfer	Crystallization	Impregnating
Furnacing	Drying	Gas Cleaning
Cracking	Mixing and Stirring	and others

Chemical stoneware replaces scarce corrosion resistant materials

As an alternative for scarce corrosion resistant materials, GENERAL CERAMICS CHEMICAL STONEWARE has many outstanding advantages. It is:

ACID PROOF through and through — not merely acid resistant. Being completely impervious to all chemicals, hot or cold, excepting hydrofluoric acid, it eliminates corrosion and leakage.

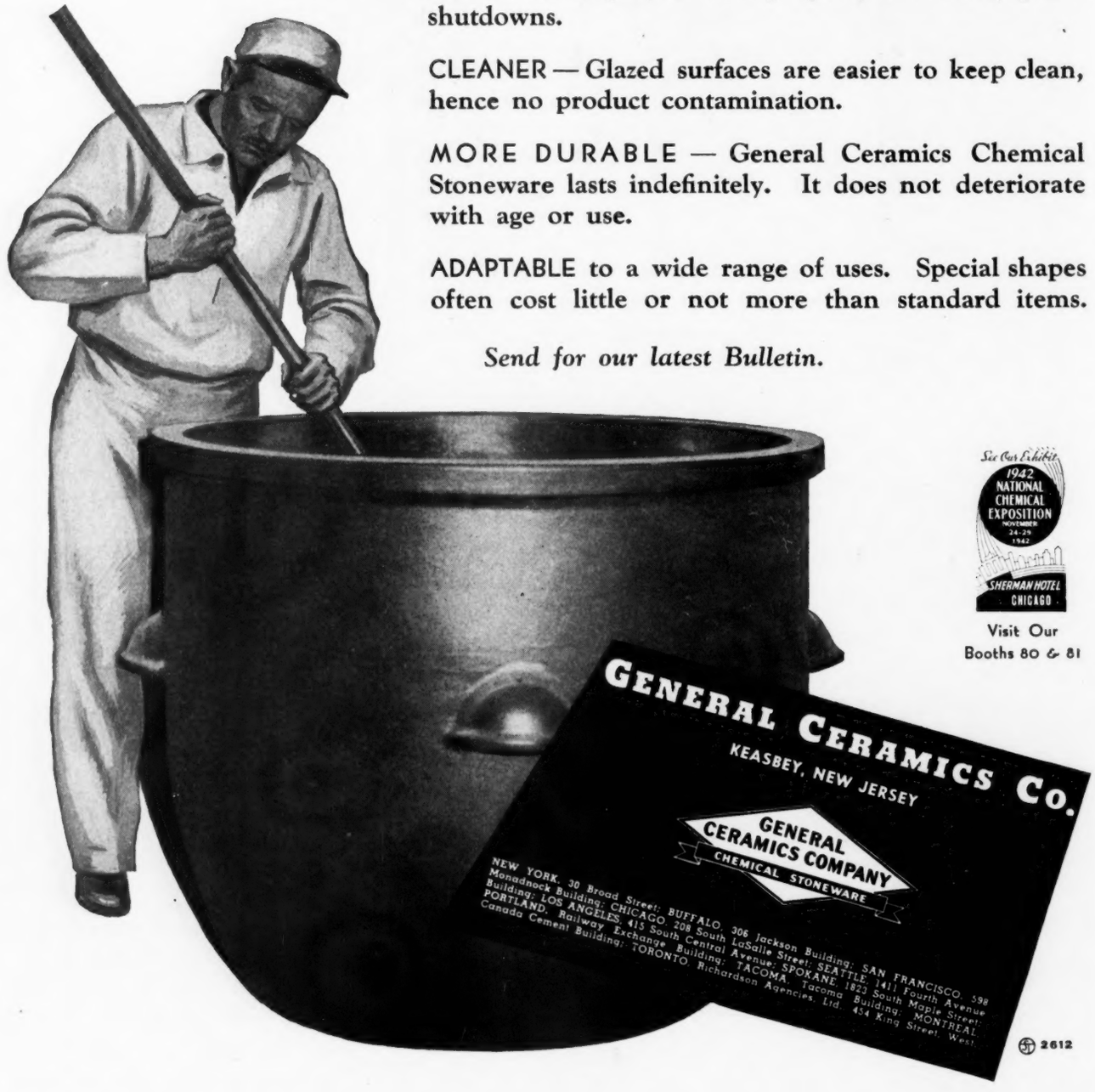
SAFER — With the elimination of leakage, it reduces hazards to employees and property and costly plant shutdowns.

CLEANER — Glazed surfaces are easier to keep clean, hence no product contamination.

MORE DURABLE — General Ceramics Chemical Stoneware lasts indefinitely. It does not deteriorate with age or use.

ADAPTABLE to a wide range of uses. Special shapes often cost little or not more than standard items.

Send for our latest Bulletin.


GENERAL CERAMICS CO.
KEASBEY, NEW JERSEY
GENERAL CERAMICS COMPANY
CHEMICAL STONEWARE
NEW YORK, 30 Broad Street; BUFFALO, 306 Jackson Building; SAN FRANCISCO, 598 Monadnock Building; CHICAGO, 208 South LaSalle Street; SEATTLE, 1411 Fourth Avenue Building; LOS ANGELES, 415 South Central Avenue; SPOKANE, 1823 South Maple Street; PORTLAND, Railway Exchange Building; TACOMA, Tacoma Building; MONTREAL, Canada Cement Building; TORONTO, Richardson Agencies, Ltd., 454 King Street, West.
2612

See Our Exhibit
1942 NATIONAL CHEMICAL EXPOSITION
NOVEMBER 24-29 1942
SHERMAN HOTEL CHICAGO

Visit Our Booths 80 & 81

"And thank you, please, to stop making these?"

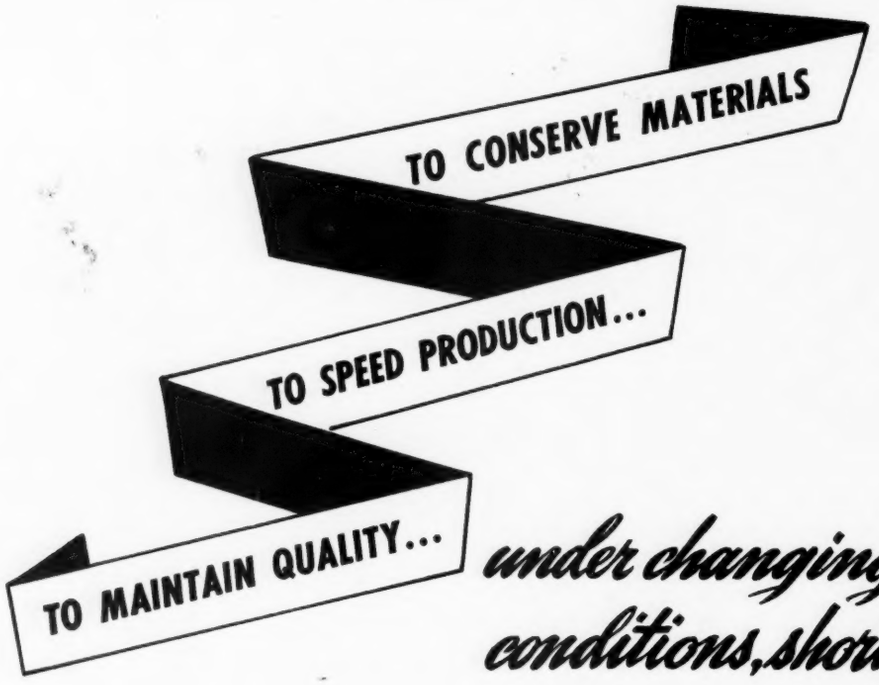
There's a big difference between a device that enables a bombardier practically to drive a nail at 5000 feet and a closure that protects products in drums. But there is a *similarity* that is much more important: there are people on the other side (Atlantic and Pacific) who have good reasons for wishing that neither one had ever been made.

When you put a Tri-Sure Closure on a drum you provide a "convoy" for every drop in it—a convoy with three weapons that have always won out against leakage, pilferage and waste: (1) a *seal* which cannot be removed unless it it is deliberately destroyed; (2) a *plug* which is always held tightly in place; (3) a *flange* which assures complete drainage.

If your job these days is to produce and deliver products that *cannot be wasted or pilfered*, a big part of that job is to protect every drum you ship. Let us send you complete information on the sure way—the 100% safe way — Tri-Sure Closures.

Tri-Sure
Reg. U. S. Pat. Off.
CLOSURES

AMERICAN FLANGE & MANUFACTURING CO. INC., 30 ROCKEFELLER PLAZA, NEW YORK



under changing conditions, shortages and restrictions

specify

STANDARD Silicates

call

STANDARD Service

Your conservation program is helped by the uniform purity and quality of STANDARD Silicates. When you use this dependable product, you can pick the right grade for your particular service, and rely absolutely on its uniform quality.

Furthermore, you can call upon the skilled help of experienced Standard Technical Service men to make your silicates go farther and be most effective, thus reducing waste of labor and materials.

DIAMOND ALKALI COMPANY
STANDARD SILICATE DIVISION
PITTSBURGH, PA.
Plants at Cincinnati · Jersey City · Lockport, N. Y.
Marseilles, Ill. · Dallas, Texas

No. 7 in a series of advertisements about new research chemicals.

FOR RESEARCH STUDY

Glyoxal
2-Ethylbutanol
Acetonylacetone

These three synthetic organic chemicals have a variety of possible profitable applications, a few of which are suggested here. At the present time only research quantities of these new chemicals are available.

GLYOXAL

$$\begin{matrix} CHO \\ | \\ CHO \end{matrix}$$

. . . being the simplest dialdehyde, has many unique properties. It is superior to formaldehyde in applications where its reduced odor and non-volatility, as well as its speed and thoroughness of action, make its use advantageous. Research quantities are available as a 40 to 50 per cent water solution and also as the easy-to-handle, crystalline bisulfite addition product.

Glyoxal shows greatest promise for hardening and increasing the water resistance of gelatin glues, casein, zein, and other protein and albuminous substances. Glyoxal reacts with a host of materials such as cresols, urea, phenols, and vegetable oils to form interesting resin products. With aromatic amines, such as aniline and naphthylamine, it forms condensation products which have possible value as rubber accelerators. It has other applications in paper sizing, preservatives, and pharmaceuticals.

2-ETHYLBUTANOL

$$(C_2H_5)_2CHCH_2OH$$

. . . is a colorless high-boiling (148.9°C.) solvent which is soluble in many organic substances. It has use as a high-boiling alcohol in lacquers and synthetic resin varnishes. Its ester derivatives of dicarboxylic acids are plasticizers possessing low volatility and water solubility. 2-Ethylbutanol is effective in azeotropic distillation processes where the complete removal of water is desired. It is 0.43 per cent soluble in water at 20°C., while water is 4.56 per cent soluble in it.

ACETONYLACETONE

$$CH_3COCH_2CH_2COCH_3$$

. . . is a liquid with a pleasant odor and a slow rate of evaporation. Even in small percentages it reduces the viscosity of solutions of nitrocellulose or "Vinylite" resins. Acetonylacetone readily forms ring compounds which are derivatives of furan, thiophene, and pyrrole, and is a promising intermediate in the manufacture of inhibitors, rubber accelerators, dyes, pharmaceuticals, and insecticides. Its boiling point is 191.4°C.; it is completely soluble in water.

For information concerning the use of these chemicals, address:

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

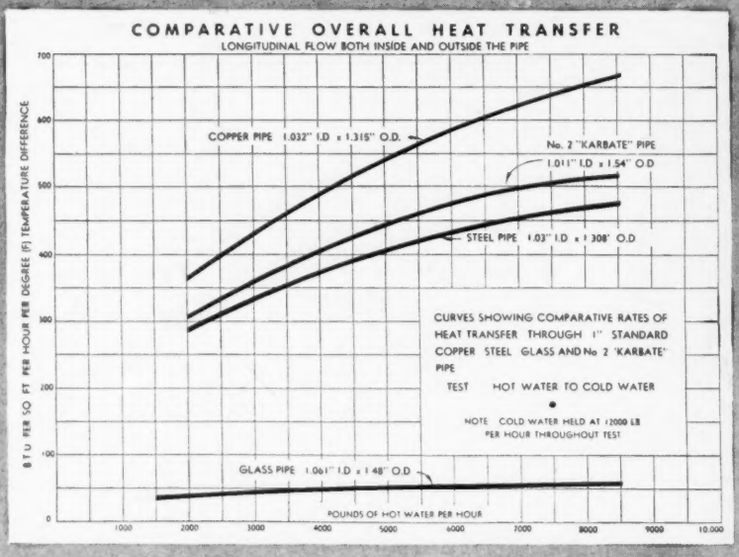
30 East 42nd Street UCC New York, N. Y.

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

"Vinylite" is a registered trade-mark.

Karbate No. 2 Pipe and Fittings

TRADE-MARK


COMPARATIVE OVERALL HEAT TRANSFER
LONGITUDINAL FLOW BOTH INSIDE AND OUTSIDE THE PIPE
B T U PER SQ FT PER HOUR PER DEGREE (F) TEMPERATURE DIFFERENCE
COPPER PIPE 1.032" I.D x 1.315" O.D.
No. 2 "KARBATE" PIPE
1.011" I.D x 1.54" O.D
STEEL PIPE 1.03" I.D x 1.308" O.D
CURVES SHOWING COMPARATIVE RATES OF HEAT TRANSFER THROUGH 1" STANDARD COPPER STEEL GLASS AND No 2 'KARBATE' PIPE
TEST HOT WATER TO COLD WATER
NOTE COLD WATER HELD AT 12000 LB PER HOUR THROUGHOUT TEST
GLASS PIPE 1.061" I.D x 1.48" O.D
POUNDS OF HOT WATER PER HOUR

Offer High Rate of Heat Transfer

RESISTANCE TO CORROSION

RESISTANCE TO THERMAL SHOCK

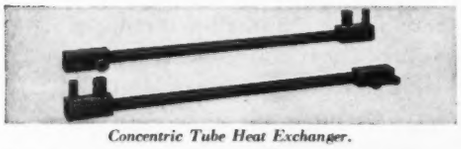
for the construction of HEAT EXCHANGE EQUIPMENT

● The high heat transfer characteristics of "Karbate" No. 2 Pipe and Fittings are ideal for heat exchange applications. The curves above show the comparative rate of heat transfer through standard 1" glass, steel, copper and "Karbate" No. 2 pipe.

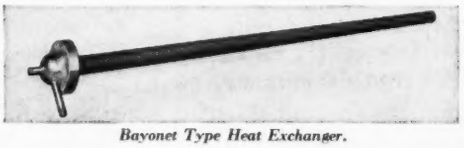
"Karbate" heat exchangers are especially applicable under conditions of severe thermal shock and corrosion. They are inert to the action of most acids and alkalies and are not affected by salt water. They will not fracture, chip or spall under severe temperature change. Practically any type of heat exchange equipment can be constructed of "Karbate" Pipe and Fittings. Examples of several representative types of heaters and coolers are shown on this page. Hundreds of such units, varying greatly in size and design, are now being used with success in industry.

Complete systems of "Karbate" Pipe and Fittings for conveying and handling corrosive materials have been installed in many plants.

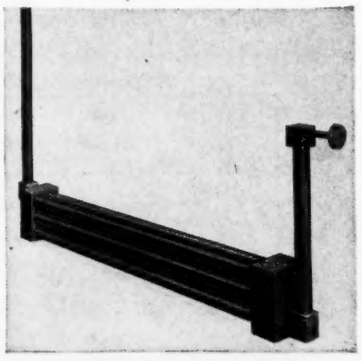
WRITE FOR YOUR COPY OF OUR NEW BOOKLET ON PIPE AND FITTINGS



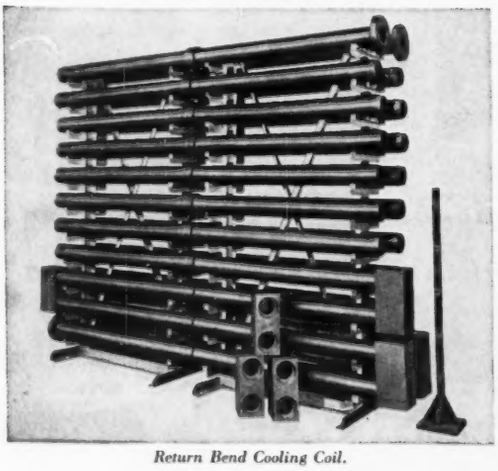
Concentric Tube Heat Exchanger.



Bayonet Type Heat Exchanger.



Immersion Type Heat Exchanger.



Return Bend Cooling Coil.

Elements for Shell Tube Type Heat Exchanger.

NATIONAL CARBON COMPANY, INC.

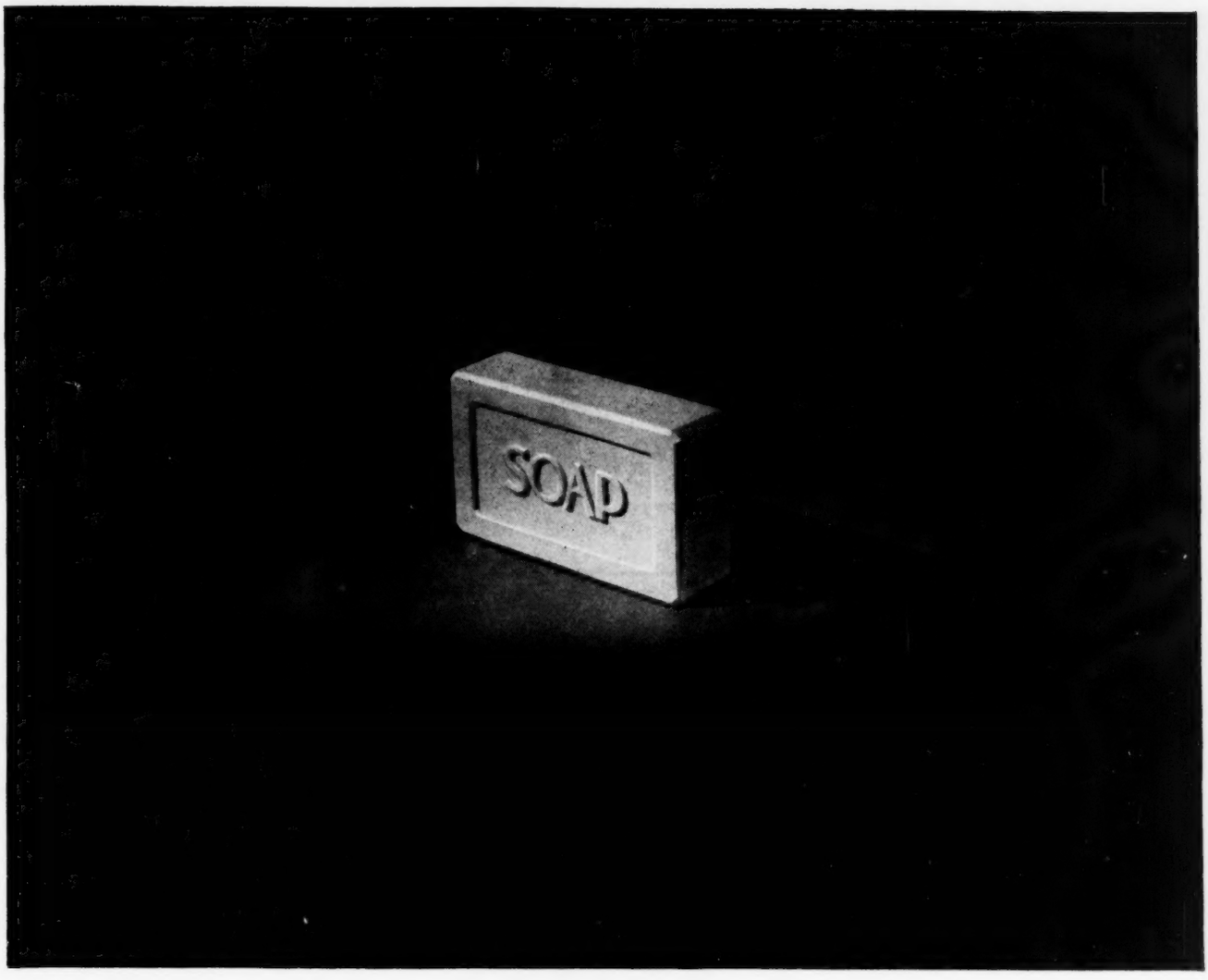
Unit of Union Carbide and Carbon Corporation

UCC

Carbon Sales Division, Cleveland, Ohio

General Offices: 30 E. 42nd St., New York, N. Y.

Branch Sales Offices: NEW YORK, PITTSBURGH, CHICAGO, ST. LOUIS, SAN FRANCISCO



DYNAMITE

• There's a lot of potential dynamite where that innocent bar of soap came from. Out of the same vat came glycerin — the stuff from which nitroglycerin, dynamite and cordite are made.

The manufacture of glycerin is an inseparable — and very important — part of the soap industry. In normal times glycerin is a by-product of soap. In times like these, when every extra ounce of gunpowder strikes an extra blow for democracy, the by-product becomes more important than the product.

Michigan Alkali Caustic has many uses, in wartime as well as peacetime. And other Michigan Alkali products are helping America's industries to keep the materials of war moving out of the factory, up to the front lines of freedom.

MICHIGAN ALKALI COMPANY

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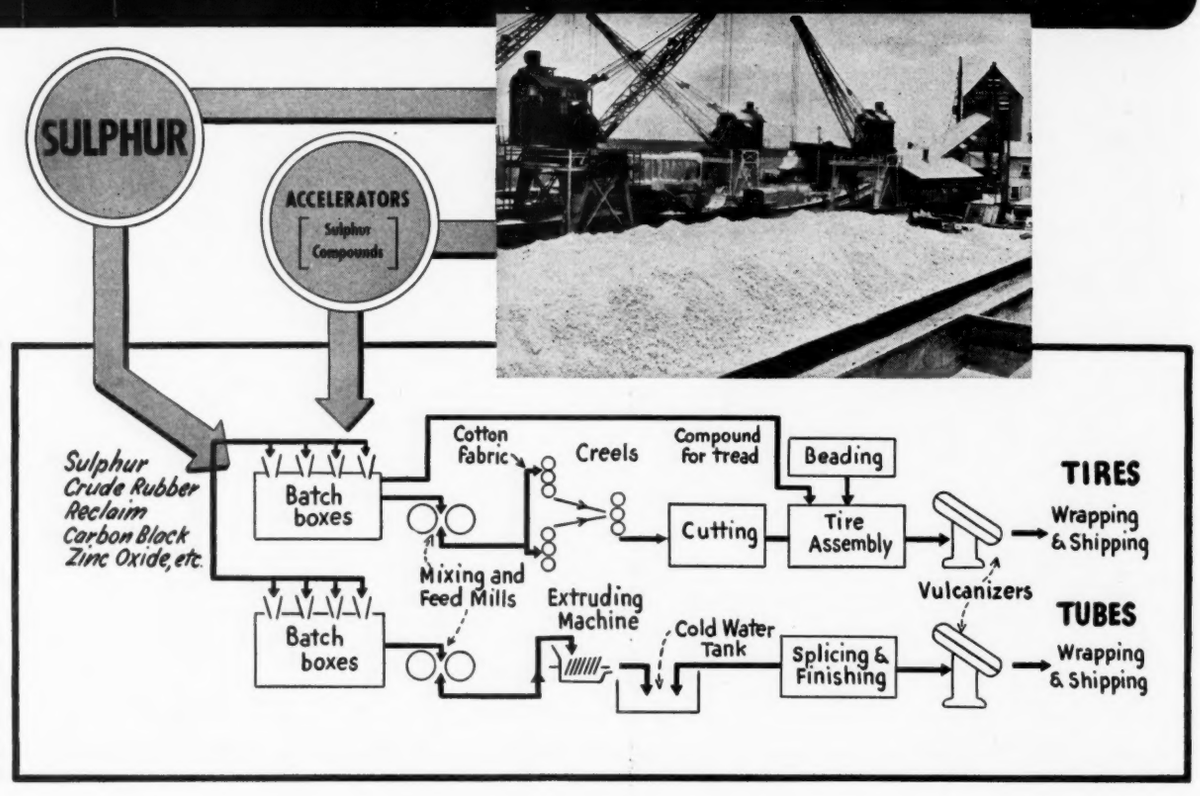
SODA ASH • CAUSTIC SODA • CHLORINE • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • DRY ICE

HOW SULPHUR SERVES INDUSTRY



RUBBER

Raw rubber is a soft, tacky substance. Compounded with 2% of Sulphur and heated to 140°C. it becomes the rubber so universally used. Accelerators and pigments, many of which either contain Sulphur or are processed with the aid of Sulphur compounds, impart specific properties to rubber. Heated with a larger amount of Sulphur it is converted to hard rubber, for many years used in the manufacture of innumerable articles.

Sulphur has been used by the rubber industry since Goodyear discovered the vulcanization process in 1839. Today, when a synthetic rubber industry is being created, we find the importance of Sulphur to the rubber industry undiminished. Not only are various Sulphur compounds used in the production of many of this new industry's raw materials but, as before, Sulphur is used in the vulcanization process. And one of the new synthetic rubbers contains more than 80% Sulphur.

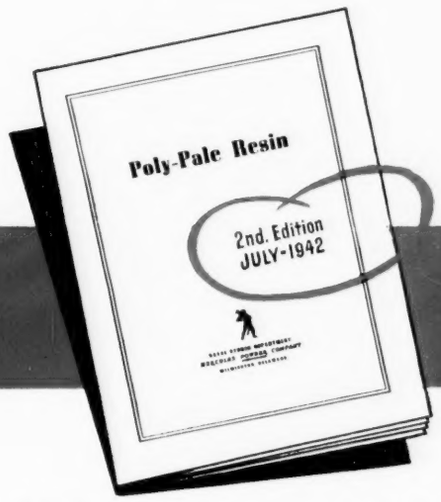
Shortages threaten in many commodities but there are no shortages of Sulphur for the rubber industry. Texas Gulf Sulphur Company has available for immediate shipment more than enough to supply not only the rubber but all Sulphur-consuming industries for more than a year.

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Newgulf and Long Point, Texas

9-TG-1

NEW BASE MATERIAL

FOR PAINT AND VARNISH



A recently developed new resin, Poly-Pale, has some interesting characteristics pointing to important applications in paint and varnish products.

It is pale in color (from WG to X on the rosin scale), free of metals, and has a lower acid number and an appreciably higher melting point than any of the natural rosins.

It is soluble in most of the organic solvents; and solutions of Poly-Pale are considerably higher in viscosity than equal concentrations of ordinary rosin. It is compatible with waxes, most synthetic resins, and all of the vegetable oils used in protective coatings.

Extensive tests indicate that this new resin should be a valuable raw material in gloss oils, hardened rosin varnishes, ester gum, rosin-modified phenolic resins, spirit varnishes, and wherever rosin is used in protective coatings.

New and valuable data are contained in the revised second edition of the booklet "Poly-Pale Resin," which has just been issued. Mail the coupon for your free copy today.

HERCULES

CHEMICALS FOR INDUSTRY

Naval Stores Department,
HERCULES POWDER COMPANY
INCORPORATED
992 Market Street, Wilmington, Delaware

Please send me the 2nd edition of "Poly-Pale Resin."

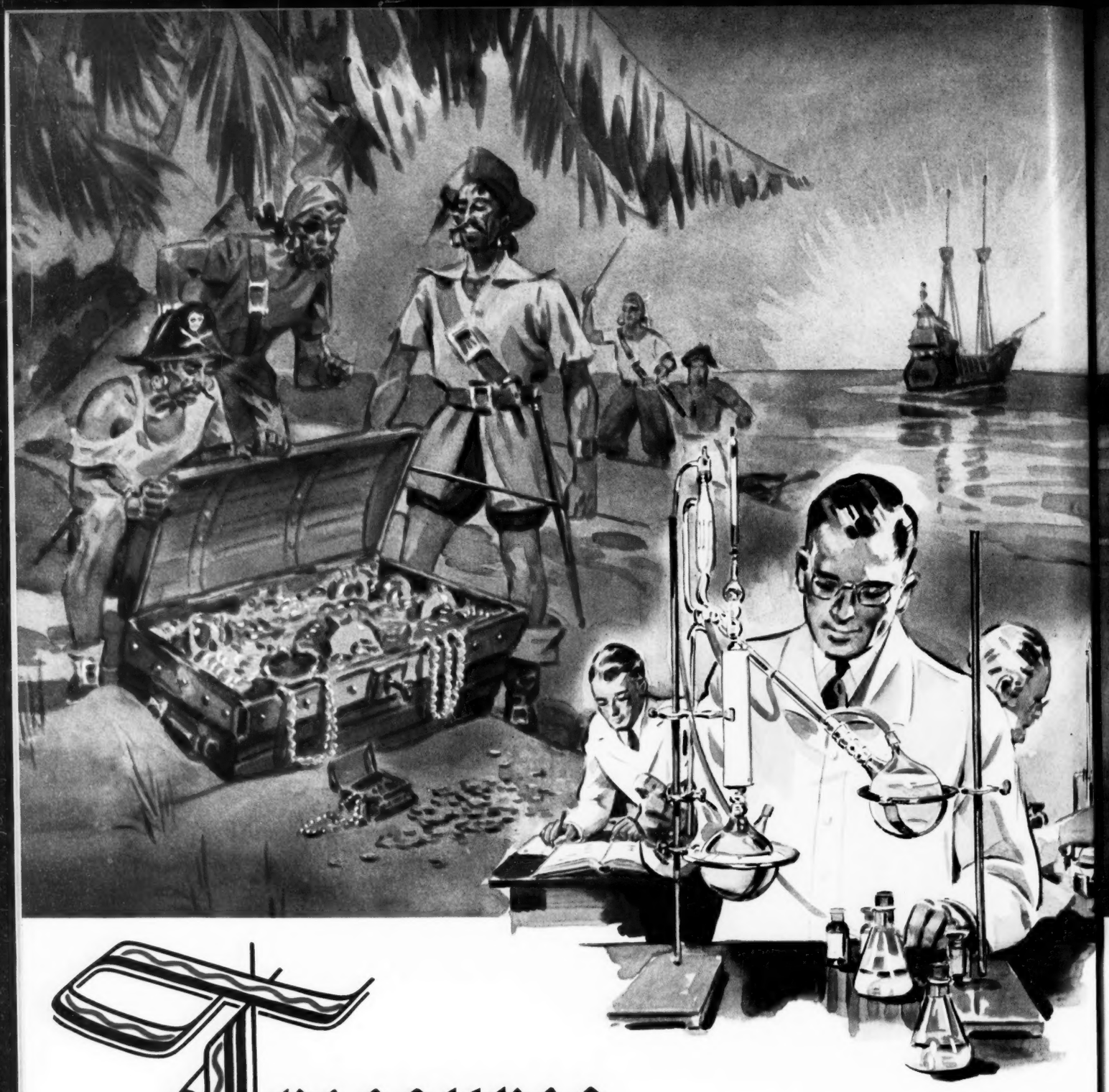
NAME .....

COMPANY .....

ADDRESS .....

.....

LL-81



Treasures ...more precious than Gold

Today there are important materials which America needs and cannot buy . . . for all the gold in the world. This is a challenge that American chemists are meeting with new and better materials.

The Nitroparaffins and their derivatives have proved to be starting points for producing many of these new materials. Note the possibilities for synthesis with just one group of NP derivatives—the Nitrohydroxy Compounds.

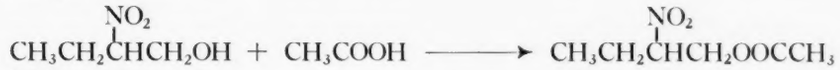
TO ADVENTUROUS CHEMISTS...

these reactions will suggest many others:

Aminohydroxy Compounds are made by reducing the corresponding nitrohydroxy derivatives:

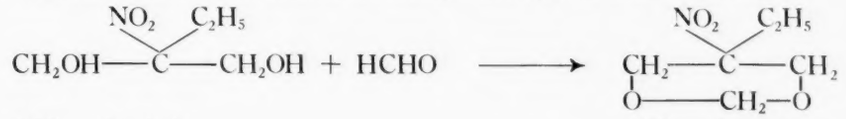
2-Nitro-2-methyl-1-propanol → 2-Amino-2-methyl-1-propanol

Nitro Esters are made by reacting nitro alcohols with many organic and inorganic acids:



2-Nitro-1-butanol → 2-Nitro-1-butyl acetate

Nitrodioxanes result from condensing a nitroglycol with an aldehyde:

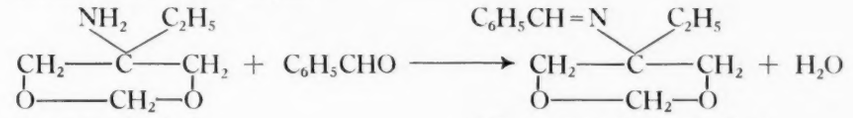


2-Nitro-2-ethyl-1, 3-propanediol → 5-Nitro-5-ethyl-1, 3-dioxane

Aminodioxanes are easily obtained by reducing the nitrodioxane:

5-Nitro-5-ethyl-1, 3-dioxane → 5-Amino-5-ethyl-1, 3-dioxane

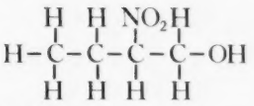
N-substituted Iminodioxanes may be made by condensing aminodioxanes with an aldehyde:



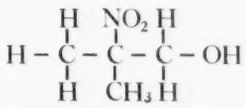
5-Amino-5-ethyl-1, 3-dioxane → 5-Benzylidenimino-5-ethyl-1, 3-dioxane

The Nitrohydroxy Compounds

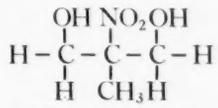
produced by condensation of the Nitroparaffins with aldehydes



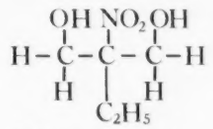
2-Nitro-1-butanol



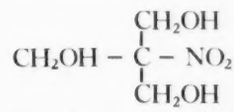
2-Nitro-2-methyl-1-propanol



2-Nitro-2-methyl-1, 3-propanediol



2-Nitro-2-ethyl-1, 3-propanediol



Tris (hydroxymethyl)-nitromethane

COMMERCIAL SOLVENTS

Corporation

The Nitroparaffins at Work will be featured in our exhibit at the National Chemical Exposition in Chicago, November 24th to 29th. You are cordially invited to visit our Booth.

17 East 42nd Street, New York, N. Y.

Chemists are finding many helpful suggestions in the Data Book, "The Nitroparaffins—New Worlds for Chemical Exploration." A copy will gladly be mailed you on request.

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HEYDEN

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SODIUM SALICYLATE U. S. P.

Three types:

Large Crystals • Flo-Crystals • Powder
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LITHIUM SALICYLATE N.F.
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Powder

SALOL U.S.P. (Phenyl Salicylate)
Granular

STRONTIUM SALICYLATE N.F.
Powder

HEYDEN *Chemical Corporation*

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LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES
CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

HEADS RUBBER PROGRAM
WASHINGTON, September 16—William M. Jeffers, president of the Union Pacific Railroad, was appointed today to head the government's rubber program. His selection was announced by Donald Nelson, WPB Chief, with the approval of President Roosevelt. Jeffers will be vested with all the authority of the chairman of the WPB over the rubber program in all its phases and will issue directives to all governmental agencies concerned with rubber. As Rubber Administrator, Jeffers' appointment follows the Baruch committee report that full authority over the entire rubber program be given to a single official and that he be "a man of unusual capacity and power." The committee's suggestion that he should also be a manufacturing executive, preferably with experience in the rubber industry has not been followed.

CHEMICALS WANTED
WASHINGTON, September 12—Chief, Procurement Division, U. S. Veterans Administration, Arlington Bldg., wants bids on miscellaneous amounts of ichthammol, ointment, mercuric oxide, oil of theobrona by Sept. 18. Also needed are 1385 bottles of acetylsalicylic acid tablets (bids by Sept. 21).

WAR RISK INSURANCE
WASHINGTON, September 1—War Shipping Administration has withdrawn the normal war risk insurance rates covering importation of industrial chemicals, chromate, soap and toilet preparations, flaxseed and others. Shipments of these commodities assume rates which were in effect under the insurances of War Shipping Administration in July.

FERTILIZER CONSERVATION
WASHINGTON, September 14—War Production Board today ordered nationwide conservation of chemical fertilizers in order to save nitrogen vital for war production. Step imposes sharp restrictions on grades which may be delivered within the 33 principal fertilizer consuming states. It limits use of chemical nitrogen and reduces number of grades available and simultaneously fixes standards for use of organic nitrogen.

DEFY JOHN L. LEWIS
NIAGARA FALLS, September 14—National Council of Gas, Coke and Chemical Workers, membership 20,000, held its first convention here and adopted a constitution "designed to provide safeguards against dictatorship similar to that exercised by John L. Lewis in the United Mine Workers." Organization is composed of secessionists from District 50 of Lewis's United Mine Workers.

HAZARDOUS CHEMICALS BOOKLET OFFERED
BOSTON, September 1—Every plant using and storing flammable chemicals should get new edition of an up-to-the-minute table of "Common Hazardous Chemicals," sixth edition, just released by the National Fire Protection Association, International. Address is 60 Batterymarch St., price is 20 cents. Contains best extinguishing methods for fire in chemicals,

latest information on shipping containers and storage safeguards, amendments adopted since 1931, etc. Order now!

TO ARMY SANITARY CORPS

ROCHESTER, N. Y., September 14—William A. Withus, in charge of technical and professional advertising in medical, dental, chemical, research and related fields for Eastman Kodak Co., was appointed First Lieutenant, Sanitary Corps, Medical Department, AUS, Aug. 28 and reported for duty Sept. 12.

ACQUIRES CHENEY CHEMICALS

CLEVELAND, September 15—Liquid Carbonic Corp. has purchased Cheney Chemicals Co. of this city which has been engaged in the manufacture of nitrous oxide, ethylene and other medical gases since 1924. Cheney will operate as a wholly-owned subsidiary of Liquid Carbonic under supervision of its Wall Chemicals Division.

MARKETS ACTIVE

NEW YORK CITY, September 15—Industrial and fine chemicals are in heavy demand this week as inquiries come in from consumers who had been relying on inventories and from heavy government purchases. Phosphates are active and good amounts of acetic acid are moving out. Production of oxalic acid continues at a high figure but spot market is practically bare of offerings. Ascorbic acid and all vitamins are in demand. Government is increasing purchases of sulfuric acid. Speaking broadly, most industrial chemicals are in better supply than they have been for several months.

INDICTED

WASHINGTON, D. C., September 10—Du Pont Company and Rohm & Haas and certain officers of those companies were charged in an indictment announced today by Attorney General Biddle with violation of the Sherman anti-trust act in the manufacture and sale of plastics. At the request of the secretaries of War and Navy, trial has been postponed for the duration. Indictment charges that the two companies engaged in a world-wide conspiracy to suppress competition in and to monopolize the manufacture and sale of acrylic products in the U. S. and in other countries and that they were members of an international cartel which included I. G. Farbenindustrie, Rohm and Haas of Germany, and Imperial Chemical Industries Ltd. of England.

N. Y. Q. GETS MINUTE MAN FLAG

BROOKLYN, N. Y., September 15—The Treasury Department has recently awarded New York Quinine and Chemical Works, Inc., a Minute Man Flag. The record of employees subscribing to the purchase of war bonds through the payroll deduction plan in the N. Y. Q. plant shows that over 95% of the employees are enrolled. In addition to supplying chemicals to the medical units of the Allied forces throughout the world, N. Y. Q. also has about 14% of their employee personnel in the Armed Forces of the United States.

is the *Sound Basis* for solving your dryer problems too

• Ten years ago it was an adventure, this matter of dryer design. Recommendations were made almost blindly, based largely on experience with other—but frequently dissimilar materials. Guesswork and luck bulked large—but the Bartlett-Snow heat engineers have changed all this.

Today "Technical Approach" has replaced guesswork—and luck—in Bartlett-Snow design. New formulas, and the new "factors" needed in solving complex drying problems have been developed, tested, proved. The variables—including those of surface evaporation and diffusion, corrosion, abrasion, tendency to cake in cooling, the dust condition, and possible galvanic action are disassembled from each other, studied, checked and the findings verified when necessary, by running samples of the material through an ingeniously arranged test dryer, so that full allowance for all the conditions can be made in the equipment to be built.

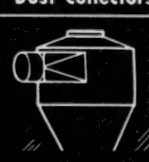
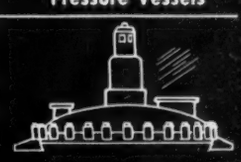
The advantage of Bartlett-Snow's highly technical and highly accurate solution of dryer problems is reflected only in Bartlett-Snow equipment. It's your assurance that the size and type, method of firing, pitch, rate of feed and all other specifications of the equipment recommended by these experts, will be exactly suited to the problem to be met. What is your heat engineering problem?

THE C. O. BARTLETT & SNOW COMPANY
6207 HARVARD AVENUE, CLEVELAND, OHIO
30 Church St., New York — First Nat'l Bank Bldg., Chicago

BARTLETT-SNOW

DRYERS • CALCINERS • COOLERS • KILNS

Also complete materials handling facilities to meet any requirement
One contract • One guarantee of satisfactory performance • Unit responsibility

Screw Feeders	Rotary Crushers	Bucket Elevators	Belt Conveyors	Dust Collectors	Pressure Vessels
					

GET THAT OIL UP. . . FAST!

How du Pont Research Speeds War Production

THIS MAN'S ARMY rolls on wheels and flies on wings — fast! And its motors roar for oil!

It's reassuring to know that the United States is responsible for 61 per cent of the world's oil production . . . that within its borders there is more crude oil and natural gas than in any other country. But it isn't enough to have the oil here, underground. We need it *now*. We need all we can get, *fast!*

Du Pont products serve on the front line in speeding the production of oil we need for victory. Special du Pont explosives and blasting agents for seismic prospecting help to discover hidden oil deposits — saving dollars and saving precious *time* that used to be wasted on dry holes. Du Pont neoprene chemical rubber, with its superior resistance to oil, is invaluable in drilling equipment, in the great hoses that are used to fill ocean-going tankers and railroad cars at top speed.

A whole list of du Pont chemicals is used in oil refining. Among them are solvents, acids and the petroleum engineer's 'doctor solutions.' Du Pont inhibitors stabilize high octane gasolines to help high speed battle planes fly faster and farther Du Pont addition agents reduce the oxidation of lubricating oils and increase the strength of oil films. Du Pont plastics protect underground pipe-lines which carry oil quickly across-country. Du Pont finishes protect storage tanks, freight cars, trucks and oil tankers at sea.

These services spell speed in supplying America's armed forces with oil . . . oil they must have *fast!*

Whether you are concerned with dyestuffs or with foods, with paint or petroleum, skilled experience is available to you through the du Pont Technical Service Man. He is backed by 140 years of service to industry . . . 140 years of experience in solving difficult problems. Call on him when you need help. Every problem solved is one more step toward winning victory.

DU PONT
REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & CO., (INC.) **WILMINGTON, DELAWARE**

PURE MILK

ONLY 118,300,000 BACTERIA PER GLASS

If milk is improperly cooled at the farm or if milking machines and cans are not kept scrupulously clean, bacteria count rises alarmingly. Milk delivered to receiving stations with a bacteria count over 500,000 per cubic centimeter sours prematurely . . . is not worth pasteurizing!

Quick, positive check of the bacteria count is developed through the use of Methylene Blue in the Reductase Test. An aqueous solution of Methylene Blue colors good milk for 5½ hours. Not-so-good milk regains its whiteness sooner. If the "dyed" milk turns white within the hour, down the drain it goes!

Methylene Blue is one of many National dyes protecting America's health . . . another product of National Research — research that has expanded into the fields of Coating Resin Chemicals, Synthetic Detergents, Certified Food, Drug and Cosmetic Colors, Biological Stains and Indicators, Anti-Skinning Agents and other products.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET **NEW YORK, N. Y.**

BOSTON	150 Causeway St.	SAN FRANCISCO	517 Howard St.	NEW ORLEANS	Masonic Temple Bldg.
PROVIDENCE	15 Westminster St.	CHARLOTTE	201-203 W. First St.	CHATTANOOGA	James Bldg.
CHICAGO	357 W. Erie St.	GREENSBORO	Jefferson Standard Bldg.	PORTLAND, ORE.	730 West Burnside
PHILADELPHIA	200-204 S. Front St.	ATLANTA	140 Peachtree St.	TORONTO	137-145 Wellington St., W.

FIRE PREVENTION WEEK

THE nation is preparing to defend itself from fire that may be caused by incendiary bombs. Equally vital is the need to prevent the slowdown of war production by fires that may result from sabotage or ordinary causes. And, at this time when we are facing material shortages, replacements in the home and elsewhere must be reduced to a minimum.

The seriousness of the situation has been recognized by every organization concerned with fire safety, and, for the first time, the sponsors of Fire Prevention Week are joined, this year, by the U. S. Office of Civilian Defense, which is charged with civil protection in wartime.

By virtue of the President's proclamation, the U. S. Office of Civilian Defense now calls upon the entire Nation to heed the danger of fire, a danger which threatens our lives, menaces the security of our homes, and waits, ready in an instant, to sabotage our war industries.

OBSERVE FIRE PREVENTION WEEK OCTOBER 4th — 10th

PFIZER QUALITY

MANUFACTURING CHEMISTS · ESTABLISHED 1849

CHAS. PFIZER & CO., INC.

81 MAIDEN LANE, NEW YORK · 444 W. GRAND AVE., CHICAGO, ILL.

An activated aid to processing **DARCO** REG. U.S. PAT. OFF. An active aid for purity specifications

It Decolorizes Liquids Like Magic
—but that's only part of the story

Sugar refiners, like many others in chemical processing industries, have learned how DARCO activated carbons put an end to "color" troubles. By adsorbing color bodies from the sugar liquor, DARCO enables them to produce brilliant, snowy white crystals of highest quality—crystals that sell!

DARCO removes impurities that you can't see, as well as those you can. Odors and tastes, for example—impurities which, when present in only a slight degree, often bar sales to critical buyers.

New methods of application are increasing both the scope and the efficiency of DARCO purification. One such method is counter-current treatment. We'll be glad to send your technical staff a booklet on this subject, so they can investigate its possibilities in your own business. Your inquiry will receive prompt attention.

DARCO Reg. U. S. Pat. Off.

DARCO

DARCO CORPORATION

60 East 42nd Street, New York, N. Y.

MERCK CONTRIBUTIONS IN THE VITAMIN FIELD

1934 *Ascorbic Acid Merck (U.S.P.) was made available.*

1936 *Vitamin B_1 was synthesized in the Merck Research Laboratories.*

1937 *Vitamin B_1 Merck (Thiamine Hydrochloride U.S.P.) was made available.*

1938 *Nicotinic Acid Merck (U.S.P.) (Niacin) and Nicotinamide Merck (Niacinamide) were made available.*

1938 *Riboflavin Merck (Vitamin B_2) was made available.*

1938 *Alpha-Tocopherol (Vitamin E) was identified and synthesized by Merck chemists and their collaborators in other laboratories.*

1939 *Vitamin B_6 was synthesized in the Merck Research Laboratories.*

1940 *Vitamin B_6 Hydrochloride Merck was made available.*

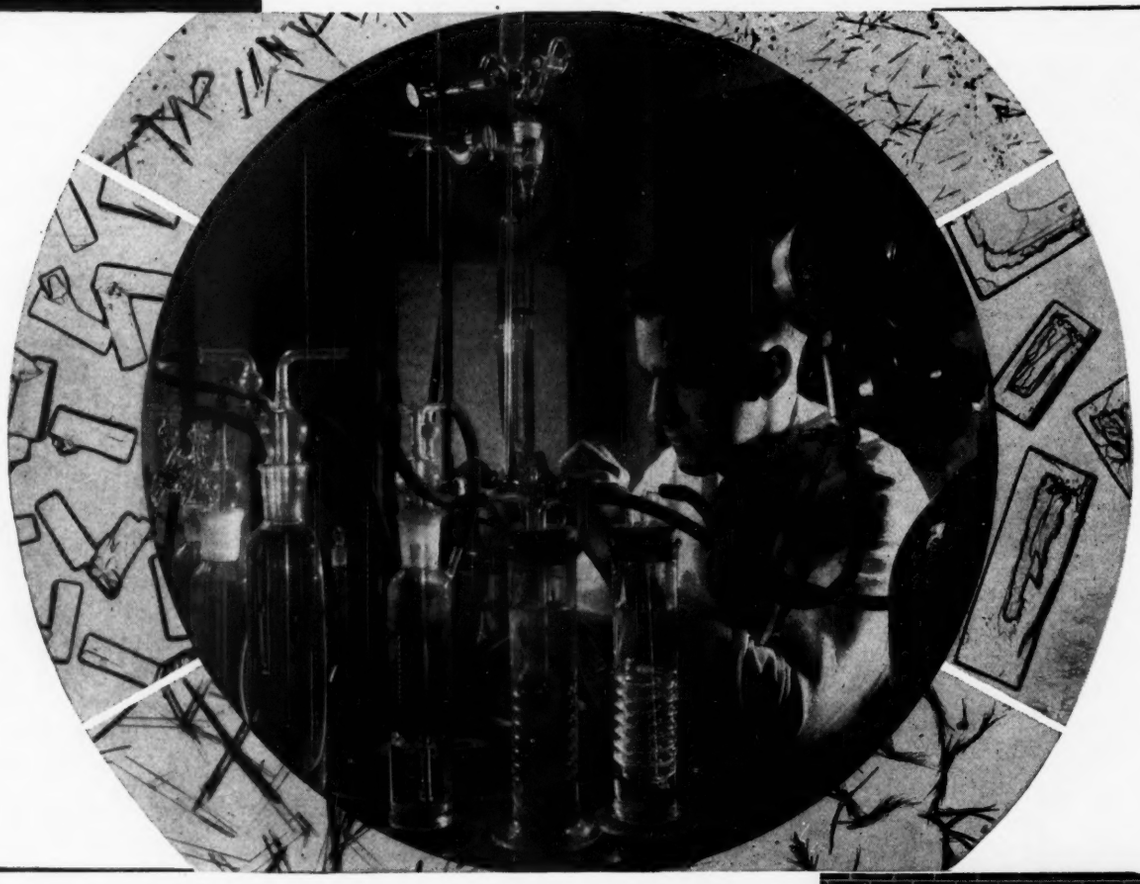
1940 *Alpha-Tocopherol Merck (Vitamin E) was made available.*

1940 *Vitamin K_1 Merck (2-Methyl-3-Phytyl-1, 4-Naphthoquinone) was made available.*

1940 *Menadione Merck (2-Methyl-1, 4-Naphthoquinone) (Vitamin K Active) was made available.*

1940 *Pantothenic Acid (Member of B Complex) was identified and synthesized by Merck chemists and their collaborators in other laboratories.*

1940 *Calcium Pantothenate Dextrorotatory Merck was made available.*



WITH vitamins commercially available as pure substances, it is possible to formulate desirable vitamin combinations with consummate ease. By using these pure chemicals of known and uniform potency, the proportions of the individual vitamins can be readily adjusted to meet the pharmaceutical manufacturer's specific requirements. It is only through the use of these pure vitamins that the high dosages indicated in severe deficiency states can be provided.

The identity of pure vitamins produced by chemical synthesis, and pure vitamins derived from natural sources—in chemical composition, physiologic function, and physical characteristics—is definitely and authoritatively established.

Our scientific staff and laboratories are prepared to serve you.

FOR VICTORY—BUY WAR SAVINGS BONDS AND STAMPS.

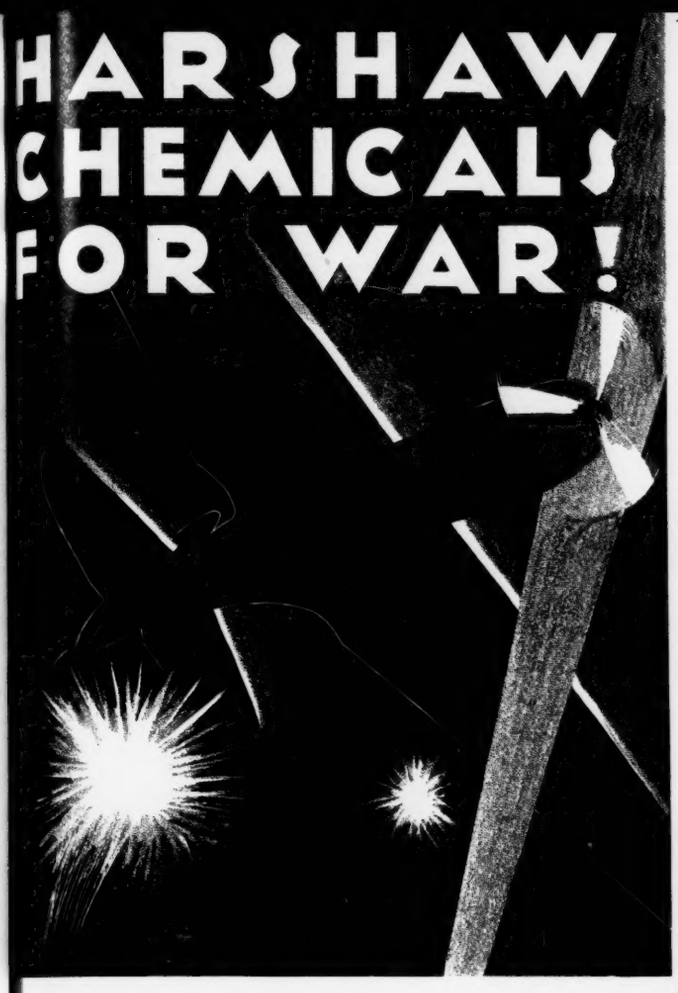
MERCK

FINE CHEMICALS FOR THE PROFESSIONS AND INDUSTRY SINCE 1818

MERCK & CO. Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

New York, N. Y. • Philadelphia, Pa. • St. Louis, Mo. • Elkton, Va. • Chicago, Ill. • Los Angeles, Cal.

In Canada: **MERCK & CO. Limited, Montreal and Toronto**



ANHYDROUS HYDROFLUORIC ACID
BORON TRIFLUORIDE
ANHYDROUS HYDROGEN CHLORIDE

Three gases used extensively in modern organic synthesis.

METALLIC SALTS AND OXIDES

Many types and grades to meet war-time industrial production requirements.

METAL ORGANIC CHEMICALS

Widely used in protective-coating industries—as driers, water-proofers, catalysts, lubricants, fungicides and for many other specific applications.

"STANREDUCE"

A material developed to meet war-time need for a short method of tin analysis in cast iron and plain steel.

SYNTHETIC OPTICAL CRYSTALS

Large single crystals of sodium chloride, lithium fluoride, potassium bromide and sodium nitrate for physical testing and research in ultraviolet and infrared—especially in organic synthesis.

LABORATORY CHEMICALS AND APPARATUS

A complete line of technical, special reagent and C.P. chemicals—a supply base for war-work in the laboratories of the country.

INDUSTRIAL CHEMICALS
LABORATORY CHEMICALS
LABORATORY APPARATUS

HARSHAW

INDUSTRIAL CHEMICALS

THE HARSHAW CHEMICAL COMPANY

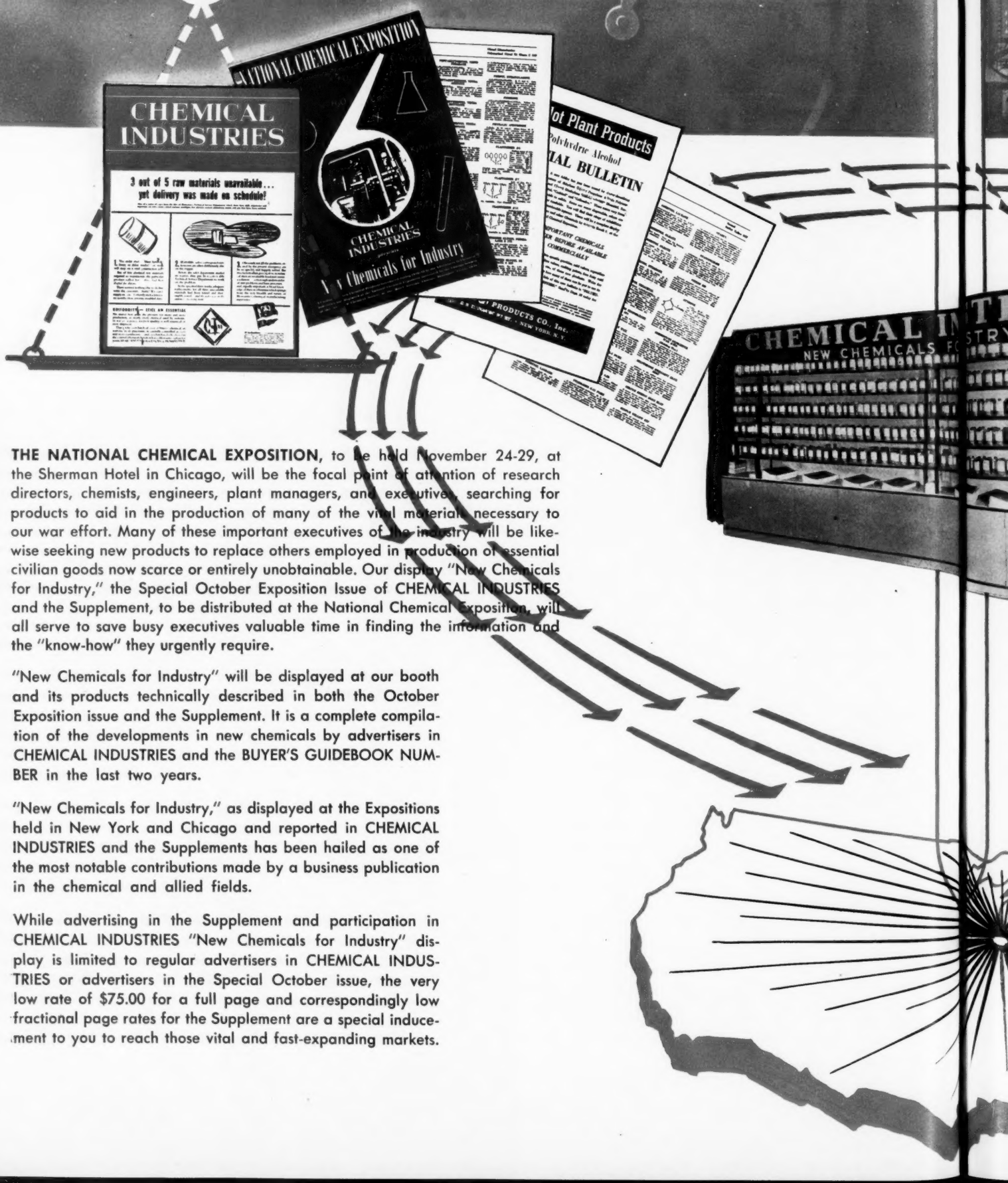
CLEVELAND, OHIO, AND PRINCIPAL CITIES

LABORATORY CHEMICALS AND APPARATUS

HARSHAW SCIENTIFIC

CLEVELAND • CINCINNATI • DETROIT

Here is a Substitute for Time!



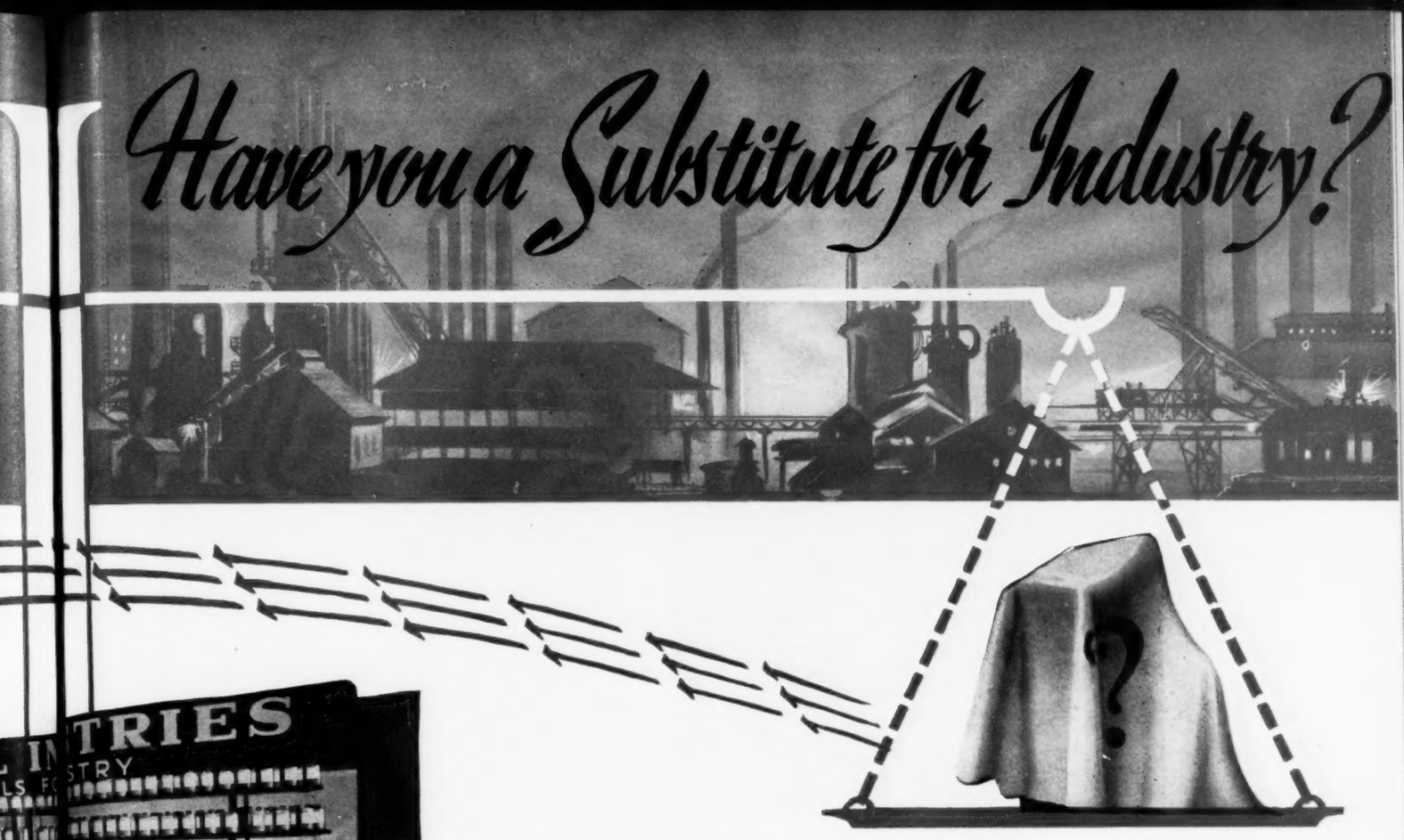
THE NATIONAL CHEMICAL EXPOSITION, to be held November 24-29, at the Sherman Hotel in Chicago, will be the focal point of attention of research directors, chemists, engineers, plant managers, and executives, searching for products to aid in the production of many of the vital materials necessary to our war effort. Many of these important executives of the industry will be likewise seeking new products to replace others employed in production of essential civilian goods now scarce or entirely unobtainable. Our display "New Chemicals for Industry," the Special October Exposition Issue of CHEMICAL INDUSTRIES and the Supplement, to be distributed at the National Chemical Exposition, will all serve to save busy executives valuable time in finding the information and the "know-how" they urgently require.

"New Chemicals for Industry" will be displayed at our booth and its products technically described in both the October Exposition issue and the Supplement. It is a complete compilation of the developments in new chemicals by advertisers in CHEMICAL INDUSTRIES and the BUYER'S GUIDEBOOK NUMBER in the last two years.

"New Chemicals for Industry," as displayed at the Expositions held in New York and Chicago and reported in CHEMICAL INDUSTRIES and the Supplements has been hailed as one of the most notable contributions made by a business publication in the chemical and allied fields.

While advertising in the Supplement and participation in CHEMICAL INDUSTRIES "New Chemicals for Industry" display is limited to regular advertisers in CHEMICAL INDUSTRIES or advertisers in the Special October issue, the very low rate of $75.00 for a full page and correspondingly low fractional page rates for the Supplement are a special inducement to you to reach those vital and fast-expanding markets.

Have you a Substitute for Industry?



Chemical Industries Exhibit of "New Chemicals for Industry" as they will be displayed at the National Chemical Exposition, Hotel Sherman

War is responsible for a tremendous acceleration in the chemical field. Better goods . . . new goods . . . cheaper goods, are being produced in every plant. With these typical war time expansions, however, numerous shortages of materials have become acute. Many new products need new chemicals, equipment, scientific apparatus and laboratory supplies that are difficult to obtain. Entirely new chemical industries are being created almost over night—witness the synthetic rubber industry designed to produce 870,000 tons—greater than the volume of natural rubber formerly imported annually from the Far East—yet somewhere, somehow, the raw materials and equipment for this and other rapidly expanding branches of the chemical industry must be found. You as a manufacturer are performing miracles by creating substitutes and improvising equipment and scientific apparatus to insure an Allied Nations' victory.

The men who will attend the National Chemical Exposition will be looking for specific information from you to help solve their problems. Due to war restrictions, it is not always possible for those directing war time activities to broadcast "feeler" inquiries. The Exposition offers just the chance these men need—a chance to locate the right source.

Whether you display your products at the Exposition or not, tell these men what materials you have to offer by using the advertising pages of CHEMICAL INDUSTRIES and the Special Exposition Supplement. Your story will reach—not only the highly selected executive type of CHEMICAL INDUSTRIES reader, but will also go to 10,000 men when they carry the CHEMICAL INDUSTRIES Supplement "New Chemicals for Industry" back to their plants.

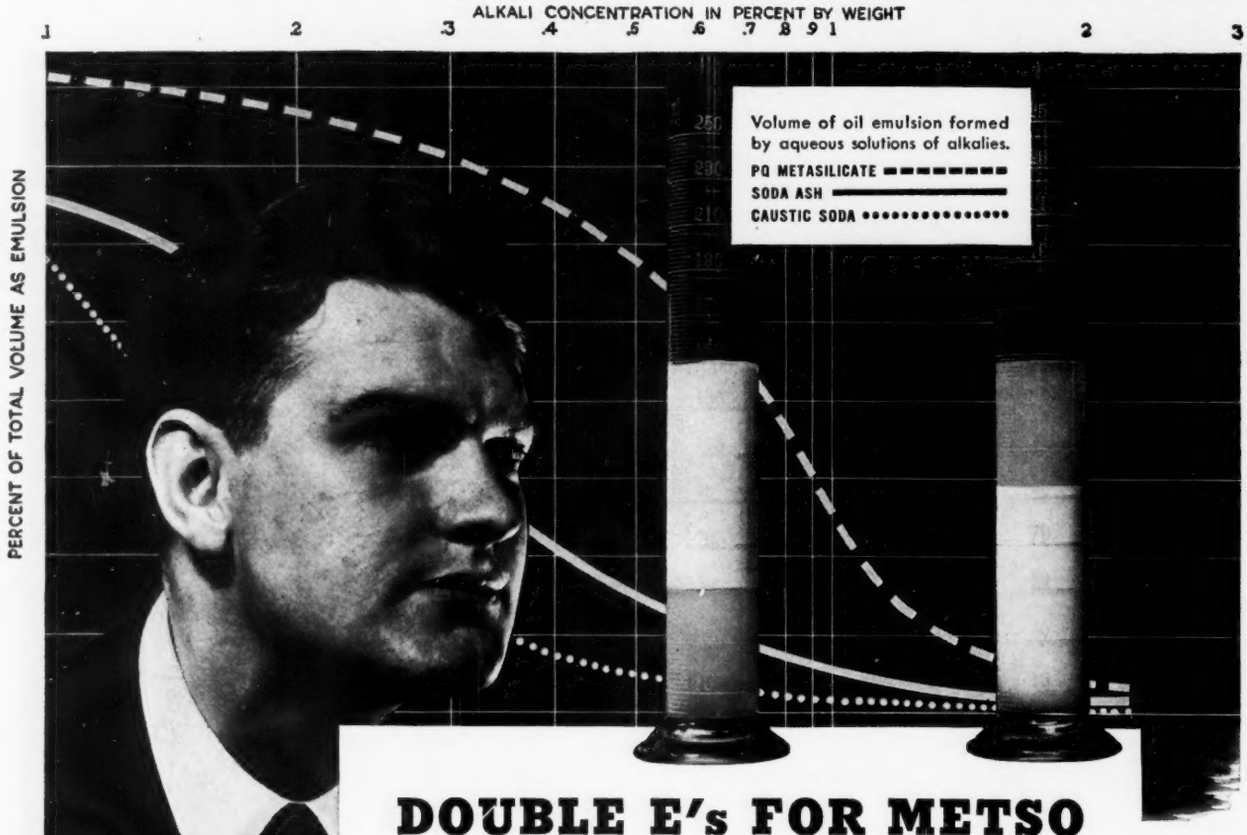
Place your story where the information will be utilized to the greatest extent. Let CHEMICAL INDUSTRIES tell you how to get the maximum results.

CHEMICAL INDUSTRIES

"The Chemical Business Magazine"

522 Fifth Avenue — 309 W. Jackson Blvd. — 420 Market Street

SOLUBLE PQ SILICATE CLEANERS


ALKALI CONCENTRATION IN PERCENT BY WEIGHT
1 2 .3 .4 .5 .6 .7 .8 .9 1 2 3
PERCENT OF TOTAL VOLUME AS EMULSION
80 70 60 50 40 30 20 10 0
Volume of oil emulsion formed by aqueous solutions of alkalies.
PQ METASILICATE
SODA ASH
CAUSTIC SODA

DOUBLE E's FOR METSO

EFFICIENT – ECONOMICAL

Sodium metasilicate* and sodium sesquisilicate†, members of the family of crystalline silicates, are leaders in the cleaning field. Used either alone or combined with soap for certain applications, they serve household and industry.

Metso sodium metasilicate* and Metso 99 sodium sesquisilicate† meet the specifications for fast wetting, emulsification, complete suspension, and prevention of dirt redeposition with controlling effect on soft metals.

Metso Cleaners are economical too. The silica content has a buffering effect, which maintains solutions at a constant pH over a wide range of concentration. And remember, Metso Cleaners are basic alkalis, sold at basic raw materials prices.

Typical of the data available on request is the chart above. Clip the coupon for more information and sample.

PHILADELPHIA QUARTZ COMPANY

125 South Third Street, Philadelphia, Penna.
Chicago Sales Office: Engineering Building

* *Metso Granular* ($Na_2SiO_3 \cdot 5H_2O$) † *Metso 99* ($Na_3HSiO_4 \cdot 5H_2O$)

OTHER METSO CLEANERS

METSO 22—A metasilicate detergent mixture with emulsifying agents. Free-flowing, light green color.

METSO 66—Metasilicate cleaner for removing mineral oils and greases. Granular, free-flowing, readily soluble.

METSO 88 SPECIAL—A liquid cleaner of low alkalinity for tin and aluminum cleaning.

PHILADELPHIA QUARTZ COMPANY, 125 S. THIRD ST., PHILADELPHIA, PA.
Send me a free sample of Metso for the cleaning of _____ together with directions for use.

Name _____ Firm _____

Street _____ City _____

An important NEW CONTAINER

Now developed Fulton WATERPROOF LINED Bags

With the shortage of metal cans and drums, wooden boxes and barrels, chemical industries and others who formerly used rigid containers are now using FULTON Cotton Waterproof-lined Bags. These bags are siftproof and moistureproof and can be furnished greaseproof. They give adequate protection against weather, and are economical to use. They pay for themselves several times over in freight and space saved, for these waterproof textile bags usually weigh only one-tenth as much as metal drums. Suitable for sweeping compounds, pigments, oxides, putty, fertilizer and other chemical products. FULTON Bags are available for prompt delivery.

If you have a packaging problem, call our nearest plant.

FULTON BAG & COTTON MILLS

Makers of essential cotton products since 1870

Atlanta **Minneapolis** **St. Louis** **Dallas** **New York** **New Orleans** **Kansas City, Kansas**

waste is a *Saboteur*

In a war economy, the recovery and reclamation of by-products is not only a profitable operation, but, because of shortages caused by war production, is often a patriotic duty. Many chemical manufacturers, who in normal times allowed valuable chemicals to flow to the sewer because the cost of reclaiming them was too high to be considered, are now finding it practical and economical to reclaim acid, alkali, dye and other liquors by treatment with NUCHAR Active Carbon.

Here are some of the chemical products being either recovered or reclaimed by simple, low-cost treatment with NUCHAR Active Carbon: Acetic Acid, Formic Acid, Muriatic Acid, Sulphuric Acid, Phenol, Glycerin, and Sodium Glutamate. Write to our nearest office for further information on the reclamation or recovery of your process liquors.

NUCHAR

INDUSTRIAL CHEMICAL SALES

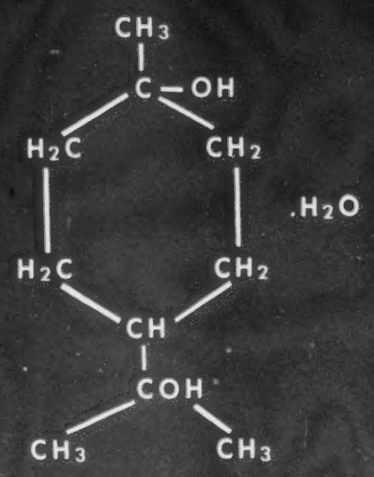
DIVISION WEST VIRGINIA PULP & PAPER COMPANY

230 PARK AVENUE, NEW YORK CITY
35 E. WACKER DRIVE, CHICAGO, ILLINOIS
748 PUBLIC LEDGER BLDG., PHILADELPHIA, PA.
844 LEADER BLDG., CLEVELAND, OHIO.

Two Interesting Terpene Derivatives

Terpene chemicals and derivatives are, structurally, midway between the aliphatic and aromatic hydrocarbon derivatives. They may, therefore, present many interesting combinations of properties compromised between these groups, and in addition provide specific powers of penetration and wetting. Two of these derivatives, now available in quantity may suggest further exploration to you.

HERCULES TERPIN HYDRATE



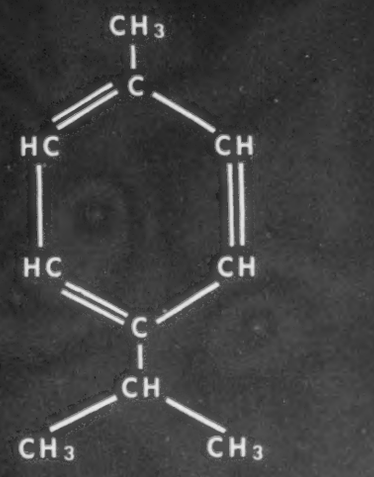
PRESENT USES: As a source of U.S.P. terpin hydrate for pharmaceutical purposes.

- As an intermediate in the production of terpineol.

PROPERTIES:

- Penetrating quality of terpin 1,8 when molten (above 116-117° C).
- Hardening properties of terpin hydrate crystals when solid (below 116-117° C).
- May be esterified, suggesting possibilities for plasticizers, essential oils, fixatives.
- Relatively stable to oxidizing agents.

HERCULES PARA-CYMENE



PRESENT USE: As an intermediate in the manufacture of carvacrol, and thymol; as an ingredient in perfume.

POSSIBILITIES:

Reported as an intermediate in the production of synthetic menthol; and as an intermediate in the preparation of other derivatives.

We will be glad to exchange ideas should the fact that these products are now available in quantity be of interest to you.

NAVAL STORES DEPARTMENT

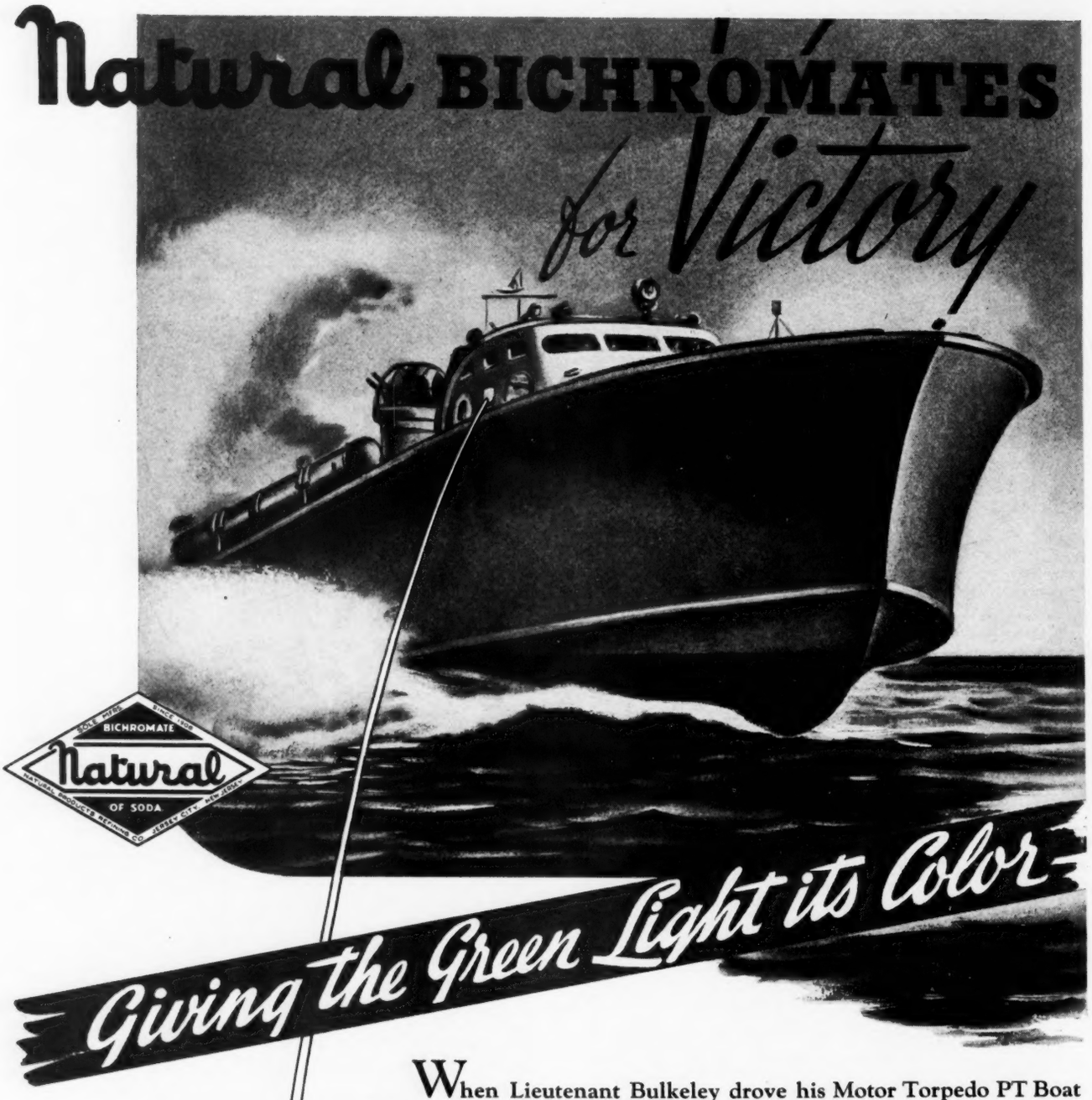
HERCULES POWDER COMPANY

INCORPORATED

992 MARKET STREET, WILMINGTON, DELAWARE

TT-16

Natural BICHROMATES for Victory



Giving the Green Light its Color—

When Lieutenant Bulkeley drove his Motor Torpedo PT Boat through a hell of fire after sinking a Jap cruiser off Cebu Island, he didn't show any running lights. But all war vessels from PT's up to battleships as well as commercial craft and airplanes carry a green starboard light to indicate their direction at night. The green glass in the lenses of these lights gets its color from bichromates of soda or potash.

Green and yellow paints used for camouflage or protection also get their color from bichromates. Thus, in the manufacturing needs of war and peace, Natural Bichromates are performing a vital function in many processes. Present difficulties have not prevented and will not prevent a strict maintenance of the high quality and uniformity in every bag or barrel which have given the "Natural" trade mark the preference among experienced purchasers of this essential chemical.

NATURAL PRODUCTS REFINING COMPANY
902 Garfield Ave. Jersey City, N. J.
Natural Bichromates of Soda and Potash

"BUY CROW-MATES"

Fires and Accidents—Foes of Production

EDITORIAL

Walter J. Murphy, Editor

America's mighty war production program definitely is out of the blueprint stage and on the many far-flung fronts of the world our enemies are beginning to feel the sharp effect of great armadas of planes, tanks and ships. While the military situations in certain corners of the globe are far from encouraging, yet it is plain that the time-tables of Germany and Japan have been slowed down and it may well be that a more optimistic viewpoint than the one we are now generally holding is justified.

It is true, however, that no purely defensive operation, no matter how successful, can be called a victory. The war must be brought to Germany and Japan and this will call for still greater productive activity.

At the moment considerable publicity is being given to shortages of vital raw materials, and rightfully so, but a far more insidious threat to greater output are the twin demons of fire and accidents.

Fire is always serious, but now as the President has pointed out in his proclamation promoting observance of Fire Prevention Week, designated as October 4-10, every loss of life, every interference with production, every loss of critical materials delays victory. Likewise a heavy toll of lost man-hours caused by industrial accidents will prolong the struggle unnecessarily.

The chemical industry, despite many natural hazardous features of production, has had a very excellent record in the past in the matter of holding down fire losses and accidents to a very low level. The present time, however, is not one for complacency. Operating schedules have been stepped up greatly in excess of normal working conditions. The draft has placed a heavy drain on skilled workers in chemical plants and much of our most vital production is partially at least in the hands of workers still lacking what in peacetime would be considered proper training and experience.

The threat of fire now is a double-barreled gun pointing directly at operating efficiencies—fire from within and fire from without the plant. We have no assurances that bombs will not drop on our large manufacturing centers. Our enemies are fully aware that America's greatest weapon is industrial production and too, as James M. Landis, head of the OCD points out in this issue, that not a plane can fly, a tank roll, or a ship sail without the use of many products of the chemical industry.

Industrial management should give very serious thought to publicizing among plant workers the importance of fire and accident prevention and the proper ways and means of successfully combating both should these dangers become stark realities. The National Safety Council's theme for its 31st Congress and Exposition to be held in Chicago October 27-29 will be "Save Manpower for Warpower." Every chemical plant should have a competent representative in attendance. Every plant executive should be doubly certain that the precautions suggested by Mr. Landis are actually being taken. We just cannot permit America's war effort to be slowed down by situations that foresight and proper planning can eliminate or at least reduce to a minimum. Only everlasting vigilance every minute of the day and 365 days in the year will achieve the results we seek and must have to win.

Latin American Relations: Serious shortages in a wide range of raw materials which are hampering war production are forcibly focusing attention on present and future relations with our neighbors to the south of us and the phrase "Good Neighbor" policy is taking on additional meaning in the existing crisis. The conclusion to be drawn from the happenings of the past two months is that for all our tremendous wealth of natural raw materials we must have additional sources of supply outside the continental confines of the United States.

The action of Brazil in coming in actively on the side of the United Nations will have a very beneficial effect on supplies of certain essential raw materials. While the volume may not be large and probably will not prove sufficient by any means, yet even small quantities will provide a worthwhile lift in this emergency. And in the post-war period we will have valuable opportunities in Central and South America to develop sources on tin, antimony, tungsten, rubber, cinchona bark, natural tanstuffs, and several oils and waxes.

The "Good Neighbor" policy, a valuable asset in the fight of democracy to survive, will then provide a shining example to a worn-torn and war-weary world of how countries big and small can live together indefinitely in peace and harmony. To be perfectly frank about it our relations in the past with our friends to the south have not always been what they should have been. A truly great opportunity is now presenting itself under the stress of war and we should make certain that every move in this direction is well-planned and flawlessly executed.

Manpower Headaches: Management is becoming increasingly concerned over the heavy labor turnover. Not that caused by army inductions for that obviously cannot be avoided, but that which is the result of labor rushing from one job to another in the hope of improving salary, working and living conditions. According to reliable statistics, the so-called quit-job-rate is soaring—something like twice what it was in 1941 and four times greater than in the year 1937. This comparison would very likely be still greater except for two factors—1. the willingness of management to accept in many instances unfair Labor Relations Board decisions in the interest of maintaining the war effort: 2. better control by many labor leaders over the men they represent, thereby reducing senseless strikes and jurisdictional disputes which often ultimately lead to job-changing by many workers.

Unquestionably the "freezing" of labor on the job is a problem that cannot be wholly ignored much longer. The available labor supply is dwindling at an alarming rate and what is left is very likely to have less potential efficiency. Time is too short to permit labor to be shifting around as it is doing now. Labor is not wholly to blame either, for many companies have been passively and even actively encouraging just this sort of thing. A short-sighted policy it is true, but some managements are reviewing the problem only with respect to today and not six months hence.

Certainly it is repugnant to all Americans to be told that they are not free to work when, where and for how much, but so is sugar, gas, meat and fish rationing distasteful, but this is total war. England hesitated much too long before coming to labor "freezing" when it was facing a foe who glorifies the belief that every last man, woman and child is but a creature of the State and with nearly tragic results. The groundwork has been laid by the Manpower Commission in Washington, but our leaders appear timid to make the final necessary move. Of course McNutt has done excellent work in obtaining voluntary cooperation but that will not be sufficient. Now that President Roosevelt has finally decided that it is necessary to "freeze" wages and farm prices the next logical step along the road of total war is to see that our manpower is utilized to the fullest extent possible. The more we give up now and the quicker we do it the sooner we will be able to return to "the American Way of Life."

Power to Tax Is the Power to Destroy: Public Law 528 for the renegotiation of war contract prices and profit limitations slipped through Congress with very little notice and is little understood by many people. This law enacted through H. R. 6868 gives any one of three Federal officials, namely the secretaries of War and Navy and the chairman of the Maritime Commission power to:

Determine whether a contractor has or is making an excess profit.

Fix the amount of the profit.

In effect, refix prices in contracts, including those already in existence which were not completed and paid for in full before April 28, 1942.

Withhold money from the contractor in the amount of the excess profit which he has found to exist.

Delegate these powers in whole or in part, to such individuals or agencies as he may designate and authorize such individuals and agencies to make further delegations of such authority and discretion.

Thus it is seen that the entire administration of the law is left to the discretion of the Navy, Army and Maritime Commission. Contractors are at the mercy of the opinions of a few individuals. No protection is given the contractor against repeated renegotiations. The contractor has no practical right of appeal from the rulings.

There was so much confusion in the Senate debate on this measure that it is hard to see how it was favorably acted upon. From one snatch of this debate:

Shipstead—*Is it not a fact that the fixing of excess profits will be done according to the consciences of the various secretaries?*

McKellar—*That is correct.*

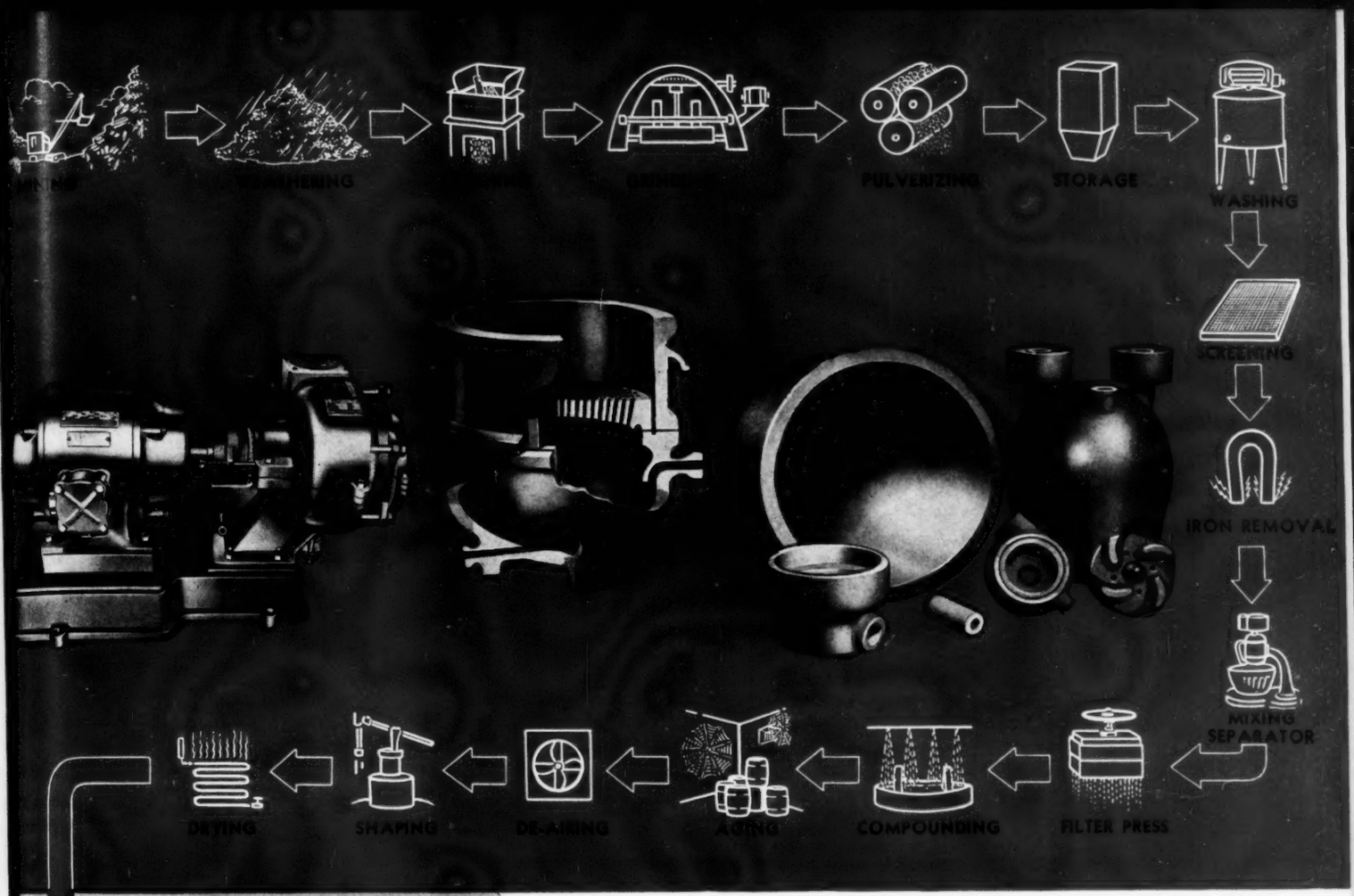
Shipstead—*If they, in their judgment and conscience, find that excess profits are being made, then they will levy a tax and collect the excess profits. Will that not be a delegation of the taking power of Congress?*

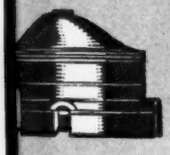
The answer is yes. The result of Public Law 528 is to place taxing power over all profits in the hands of a few individuals. This power should be retained by Congress.

But aside from that we are interested now in efficient production to win the war. Under Public Law 528 the contractor works with peak effort toward high efficiency on the first part of a large order until a high profit is in sight, then realizes that any future increase in production will not only result in no profit after renegotiation but also will cause him to take new contracts at reduced rates and higher risk factors.

This along with the fact that both the excess profits tax and the renegotiation law are means of taxing the same corporate income tends to slow production.

While nobody should be permitted to get rich out of the war, it would be strange indeed for America if aggressive, vigorous producers were not rewarded more than sluggish laggards.





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3. It is made 100% from non-critical materials and is one material of construction for which priorities are not necessarily a prerequisite to obtain.

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The substitution of "U.S." Chemical Stoneware for synthetic, metal and rubber process equipment means more planes . . . more tanks . . . more guns . . . and a quicker victory.

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AKRON • OHIO

ENGINEERS, MANUFACTURERS, ERECTORS of CORROSION RESISTANT EQUIPMENT

Industrial Planning

INDUSTRIAL planning is a little understood art. The words roll majestically from those who can hardly plan their private lives from one pay check to the next, these often from a public treasury supported by a befuddled taxpayer, or from a private philanthropy. The demagogue confuses it with "monopoly" when he fears he is about to miss the boat. It is really the most complex problem facing management, far more intricate than technologic development.

There are a number of basic principles that must be reckoned with if this planning is to achieve even the slightest hope of success. For example one must have a full knowledge of the point of departure. Otherwise it is like jumping off a strange rock in a strange locality at midnight in the dark of the moon. A broken neck and finis may easily follow.

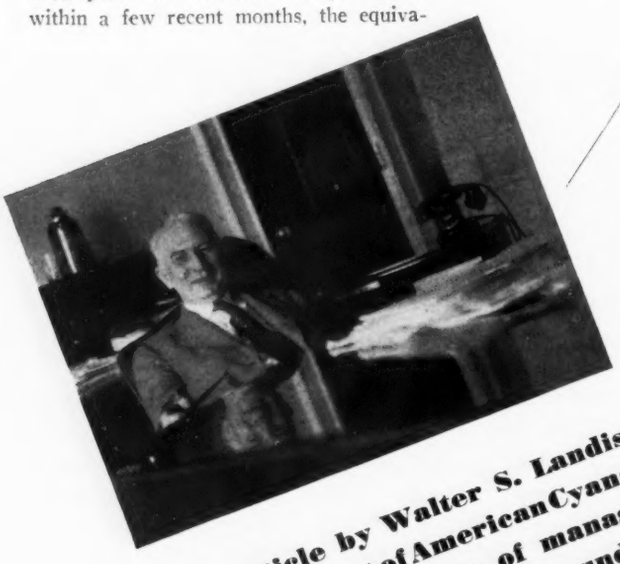
We must have a full understanding of the economic principles that rule the industrial world. To dismiss them on the thesis that Government control will nullify them is equivalent to arguing with the Law of Gravitation to make the apple fall upwards into the tree. Government ukase is about as effective in evading economic law as throwing one apple up while a thousand are falling. Even though that may hang in the crotch, it won't attach itself and grow.

There is being added to our three hundred year old structure of production within a few recent months, the equivalent of more than half its all time accumulated total. This increase is in part Government owned, the rest mortgaged to it. Such an accession, in so short a time presents a colossal task of digestion. It comes unfortunately when our country has for some years been under the influence of the falsest of economic propaganda that has ever confused a nation. Private industry is confronted as never before with the task of survival, and industrial survival is national survival.

Must we reckon on a postwar political jugglery of indefinite duration eventually putting these plants into competitive service on a wholly subsidized basis? Is this decision as to ultimate disposition to be made on a political or on a sound studied economic basis? A sincere administration should now, today—and I mean today when this is not yet in the political ring—make pronouncement on this vital issue. Or will we have a multitude of parasitic TVA's on our hands when the emergency is over?

The first and foremost problem is to get every demobilized man back into normal employment; also an army of erstwhile munition makers. We in industry have accepted seriously our obligations to our drafted employees. But in the meantime our shops are being closed to free labor as fast as WLB can sign the Union dictated orders, and the returning veteran will have small chance with the Union and its high fees and dues. Just how are we to solve this serious problem, and in accordance with the law, and more particularly in regard to our assumed moral obligations, not to mention our debt of gratitude to our soldiers and sailors? Yet our planning is academic if we leave the labor relationship to chance and political chicanery.

Some idea of the magnitude of this problem may be gained from the fact that there will be more than 30 million individuals to be absorbed in peace-time industry. This includes those in the various armed forces, in expanded Government divisions, and individuals taken out of normal peace-time production for the munition plants. With their dependents this group will include a very large proportion of the population of the country. Unless constructive planning is made to bring this enormous percentage of our population back into remunerative employment we face chaos. There is only one organization that can solve a problem of this magnitude and that is industry itself. There is only one way that industry can deal with this problem and that is to organize industrial groups charged with the responsibility and given the authority to so regulate the functioning of the individual units of the groups that prices and production



This article by Walter S. Landis, vice-president of American Cyanamid, covers a phase of management which is too little understood. A second article is in preparation covering corporate considerations and will be ready soon.

and distribution can operate under natural economic law. Since industry has never functioned in this country under such a system it may be necessary for Governmental authority to exercise veto power over the several items that constitute a working program and until industry learns the economic principles that should function properly in such a program. In Europe these industrial groups are schooled in this type of operation, but in this country there is no such experience in industry and certain supervision and control will be necessary until the industrialists have been educated to the proper functioning of such groups for the greatest good of the greatest number of people.

The last thing in the world is the restoration of the old NRA under a control unfamiliar with industry and its problems and certainly entirely unacquainted with the economics. It is a problem for the ablest minds of industry and the highest talent that the Government can find.

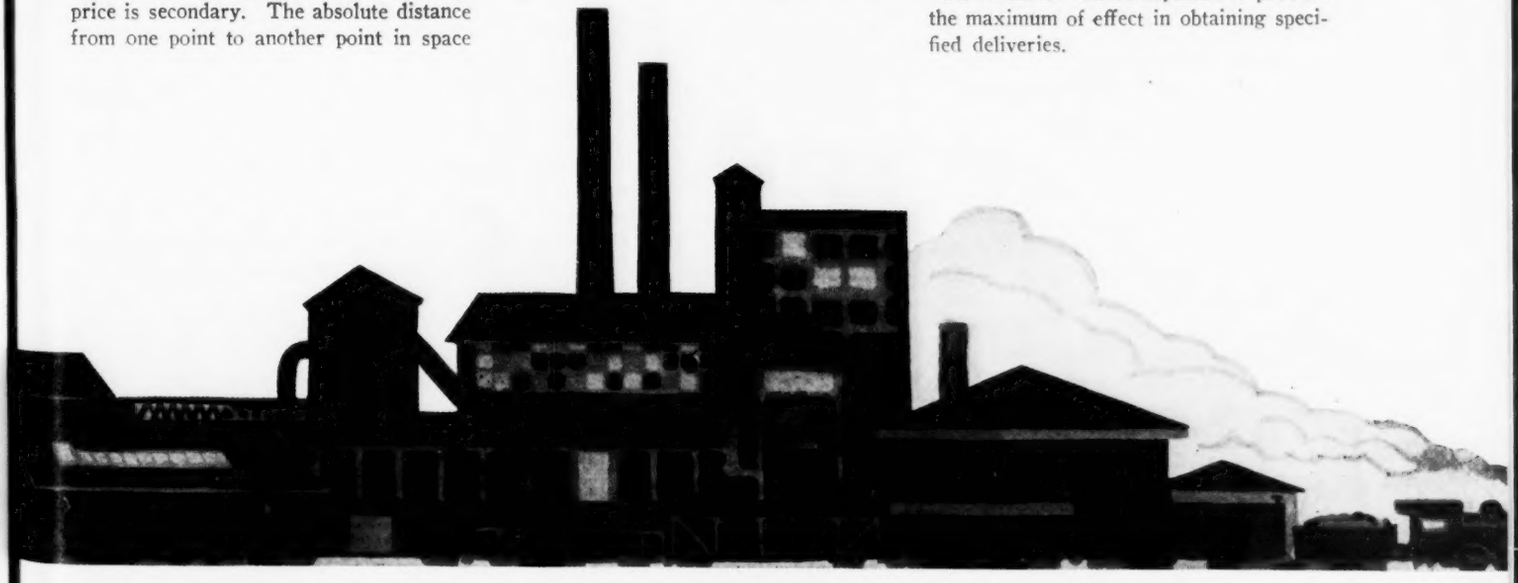
Appreciation of the social aspect of industry is rarely approached from the fundamentals, the preferred method being to employ the emotional. The laws of nature are inexorable. Nature gives no guarantee of security for this would mean extinction of the species in the struggle for existence. Survival is the result only of struggle on the part of the individual. It is, therefore, absurd for any planned national economy contemplating any comprehensive system of guarantee of security to the individual, for such will also equally assure natural extinction of that individual as a producer. On the other hand the individual can properly be assisted by education and training, just as nature provides protective coatings and colors.

All natural phenomena tend to seek a condition of equilibrium. All exchange of commodities and labor and services must obey this same principle of equalization. The injection of a system of price is secondary. The absolute distance from one point to another point in space is in no sense influenced by the system or unit of measurement. Our system of prices, therefore, has no influence upon the equilibrium we are speaking of, for a price structure rests on a purely arbitrary choice of unit and one that has been changed successively from the beginnings of civilization. The absolute unit is the quantity of material one can obtain in exchange for a given amount of service. In order that we may have what we call prosperity these exchanges must be equalized for all classes of society, although they may vary with respect to the contribution of the particular individual in each of the classes. We cannot have prosperity if the services of one group are rewarded unequally as compared with that of another group. If by artificial system such wages of industry are raised above the equilibrium basis and similar wages in agriculture remain below the equilibrium basis, then agriculture cannot buy industry's products. Depression follows.

The history of all human endeavor has been to ever increase productivity of the individual either by better education, better training or the use of more efficient tools. The result is that the exchange value of products must always move in one direction and that is downward. In consequence we cannot permanently help any group by subsidizing them at the expense of another group to enable the former to maintain a higher exchange value. The leveling process must alway be to attain the equilibrium at a lower point. Nature gives us many examples of this—the water seeking the lower level, heat the lower degree of temperature. These are a few of the economic principles that have been so mangled in the last years, not only in this country but all over the world. Pump priming was a typical example of a false economic principle. Government spending fundamentally violates the principle of equilibrium and will destroy completely any system of sound economics.

The idea that an organization of craftsmen can raise wages indefinitely and without regard to productivity in their particular industry and expect eternal prosperity is as false a doctrine as one can imagine. Such deliberately creates dis-equilibrium and must bring about depression. The curious thing about it is that a proper approach would give everybody more of the world's goods and raise the general welfare of the whole population. To assess one group for the benefit of another ultimately kills the goose that lays the golden eggs and then everybody is without eggs. Several great civilizations have disappeared from this earth because of violations of economic principles, and more are on the way.

As a prime necessity for reemployment of demobilized personnel, is the returning of the plant to peace-time production. Some factories have required relatively little alteration to fit them for munition production. Others have undergone such complete rearrangement that the return to normal is a major rebuilding task. There are all scales of readjustment in between these two extremes. Some plants may be ready to function on their old schedules almost as soon as raw materials can be assembled. With others there will be a decided time interval before they are ready. Millwrights must be available for resetting of equipment. Schedules of raw materials required for the normal program should be available and in the hands of the purchasing agents as soon as the word can be given that the change-over will be completed on a given date. It should be emphasized that suppliers of raw materials and of intermediate or semi-finished products may require time for their own readjustment and that it would be very helpful if they had advance notice of the types and kinds of material to be called for. Their own schedules can be adjusted to produce the maximum of effect in obtaining specified deliveries.



When construction work has been completed and munition production is on a relatively smooth schedule certain branches of an organization find themselves without immediate pressure, and these groups can be used effectively for creating new designs and changed production methods. It is important that this phase be dealt with comprehensively before rehabilitation of plant. Opportunity for such comprehensive reorganization of production and production methods is rare in normal operations and the advantage of carrying such changes to the maximum of effectiveness should not be overlooked.

Surplus Equipment Problem

The disposition of surplus equipment acquired upon such revolutionary program as has faced industry incident to the war, is a serious problem not easy to solve. In the rehabilitation of the plant a very careful appraisal of the capabilities of each unit should be made and the least efficient scrapped. If a comprehensive understanding of economic principles could be effected it would tend to spread the postwar demand for peacetime products, and a vast amount of equipment could and should be scrapped. Such is assuming a utopian situation and excessive competition of a most unsound character may hold in service a vast amount of inefficient equipment on the fear that potential business might possibly be lost. It is unfortunate in this country that the trade association has lost its proper function of educating its membership in fundamental economics. Our International competitors are going to possess enormous advantage over American industry because of our political charlatanism. There should be a lot of production equipment scrapped at the close of the war, first because its productive capacity is not required; secondly because it is inefficient, and thirdly because the art will have moved on. It should be the function of the trade association to educate the membership in these fundamental principles and which should automatically reflect in a more normal curve of production. We should be restrained from trying to meet overnight the pent-up demands.

The all-important question in reference to rehabilitation is to where the capital is to come from to carry over the period of rebuilding and to acquire the stocks of raw material, and to cover the normal credit period. As it stands today the politician with his selfish concept and his "soak the able" slogan is creating a chaos of terrible import. Business must learn the art of publicity, must relegate its legal minds to the problems of law, and not rely upon such group for either establishing or maintaining its public relations. This latter is an art in itself and until business recognizes the principles and methods of molding public opinion and employs experts in that profession it is paying a frightful penalty, and may even bring about its own destruction. Not only must it educate sound economic legislation but also must retrieve its position in the eyes of the public to attract this very necessary capital for restoration of its normal function. There are long periods of peace between short periods of war and industry really lives upon its peace-time efforts not its war exertions. It better take a fresh start in presenting its case in the Court of Public Opinion, and consider this a major problem.

We face a little different situation in this country than we did twenty-five years ago. The enormous development of the automobile industry followed by the radio, synthetic organic chemistry, and important household innovations gave us an unusual opportunity for exercising our industrial ingenuity over the intervening period. These proved to be large and important factors in our economic life, using vast quantities of raw material and skilled labor in their production. Undoubtedly aviation and possibly television will be important contributors in the future, but it will take sometime for either of these two industries to command anything like the industrial activity that followed the development of the automobile, of the household refrigerator, even of the radio. Revolutionary changes in the whole aviation industry would be necessary to replace the automobile, even though there were no important changes in the last model of car produced. On the other hand it is to be expected that quite noticeable changes will take place in the automobile industry with new knowledge, new materials of construction, and with improved fuels available in large quantity. There will be a lot of household equipment required since it calls for relatively high rates of replacement of many of the smaller articles. The large amount of capital destroyed in the war will call for cheaper and better services to maintain the old living standards in the years to come.

Instead of bringing revolutionary new industries into being as did the last war, this time the advances will be largely in improved designs and processes of production and emphasized by a critical replacement demand on the part of the consumer. The new things in sight are relatively insignificant as they can be appraised today and should not be a deterrent to carrying on in the more usual fields of activity. So far as can be seen there is little more to be imported from Europe so that our chemical industry does not have such a great gap in its development as was evident in the last war. Synthetic rubber will occupy some small position in our economy but it will be a long time until it completely displaces the natural product with its low cost of production. The plastics industry is promising and undoubtedly will be of increasing importance, but is is not going to be revolutionary and will meet with severe competition from surplus producing capacity of older products available in increased quantity. One must not lose the sense of perspective in a field such as this, replacement as it might be called, and which is in no sense comparable to a wholly new endeavor. To repeat, this war is going to give us new designs and new methods of construction and abundance of well-known but hitherto specialty materials rather than revolutionary new products.

More Research

A broadening of commercial research is in order. More comprehensive surveys of the desires of the many classes of population is in order. Naturally this must include the types of articles wanted. But in addition it must go further and study better methods of distribution than we have yet evolved. There is far too large a spread between factory costs and consumers' prices, and these latter are controlling in wide distribution. It is not in good proportion to expend vast sums in technical research to save a few per cent in manufacturing when 50 or even 100 per cent of factory cost is consumed in distribution. More of this research expenditure must be directed to economy in the latter item.

Of greater importance than any of these items is industrial relationship. Industry must, as referred to above, educate the public to its place in any national economy. Few of us realize that democracy came about through the pressure of industry. Trade and commerce and production required freedom of action. No one was interested in production until he was free to utilize to the full the fruits of his industry. When the feudal lord took all his product he was not interested in expansion. When the tax gatherer took all his profits he was not interested in founding a larger market. When the merchant was so confounded by export and import restrictions he was not interested in looking for foreign outlets. It was the pressure of industry that slowly forced relief from these burdens and demanded a democracy, a voice in the setting up of favorable regulation. Once the principle was established anywhere, industry moved into and thrived in these democratic communities. It is not as so many try to tell us that industry is founded on democracy, it is just the reverse. Any influence that restricts indus-

trial development must in consequence reverse the democratic trend.

Industry must recognize this principle and must develop as a fundamental unit the public relations department. Industry's guiding staff must become a part of the political unit, and that means the election district or the ward. In a democracy here lies the power that makes the future and unless industrialists recognize that, they have made a complete failure of their relation to the public and the nation. They must begin back home in the election district to instill sound principles of government, or there may be no need for this planning for there will be no industry as we understand it.

Some of the details that logically follow the general analysis above offer opportunity for immediate study. The redesign of product and the reorganization of production processes require first a survey of the probable new materials which are few, but more particularly of the performance of substitutes, many of which have had their first trial incident to the shortage of materials. One can accumulate the information on properties and possibilities of these materials and place an orderly and comprehensive schedule in the hands of the designing engineers and the process technologists. All producers face the problem of future market and will cooperate to supply this information. As far as production lines are concerned, that is largely a specialized problem with the individual institution.

A comprehensive survey should be made of the competitive facilities that have been added in the logical marketing territory of the institution. This is not easy to obtain at the present time since much of this equipment has been added for military production, but there are ways of assembling constructive information. The sales force travelling the territory, if properly instructed, can give a very fair, sometimes complete story of these facilities. Consultation with contractors and suppliers can add to this information. The trade news frequently carries items which in intelligent hands can be readily evaluated It is important to know the radius of effective action of any such competitive institution, and that the circles of coverage be worked out in detail so that overlapping territories are easily recognized.

It is important to recognize the range of flexibility of some of this new construction and a comprehensive analysis of its adaptability to competitive production should not be overlooked.

The commercial departments must familiarize themselves with the vast movements of population and the new centers of consumption that are being set up. It is very important in this planning to see that adequate coverage of these new consumers is provided for in the allocation of personnel. Branch offices may become obsolete and should be moved. In other cases the branch may need fortification. It is never too early to attempt penetration of these new areas as soon as goods are available and it may be constructive to even pinch certain territories for the benefit of the new ones in order to obtain a basic position.

The whole world is going to find itself short of manufactured goods at the close of the war. In the meantime many foreign countries will have fortified their manufacturing positions, at least in a small way, to alleviate the most essential goods. In any comprehensive survey of commercial possibilities these foreign markets must not be overlooked. They will prove at least of temporary value as outlets for a great many industries. Commercial representation should be cultivated, educated and organized to take advantage of these markets just as suggested for domestic outlets. The task of rehabilitation is so enormous that industry cannot overlook any possible distribution of its products and these foreign countries will play an important part in the solution of our problem.

New Possibility

The traffic departments must give consideration to this new geographical possibility, making early plans as to how it can best be serviced. New routes and roads must be studied. The type of service likely to be demanded must be considered for this may require a different packaging for most economic delivery.

The expansion or contraction of established plants to meet these new conditions is self-evident. Even new production units may be called for servicing of certain concentrated communities that in prewar days did not warrant such consideration. The property unit should canvass the situation at the earliest possible date to see if the war residues may be adapted to the production problem at hand. Some organizations have already paid a great deal of attention to this phase and have been able to efficiently expand munitions production into districts which they will convert later on into branch production units for peacetime goods. This is the most effective kind of planning.

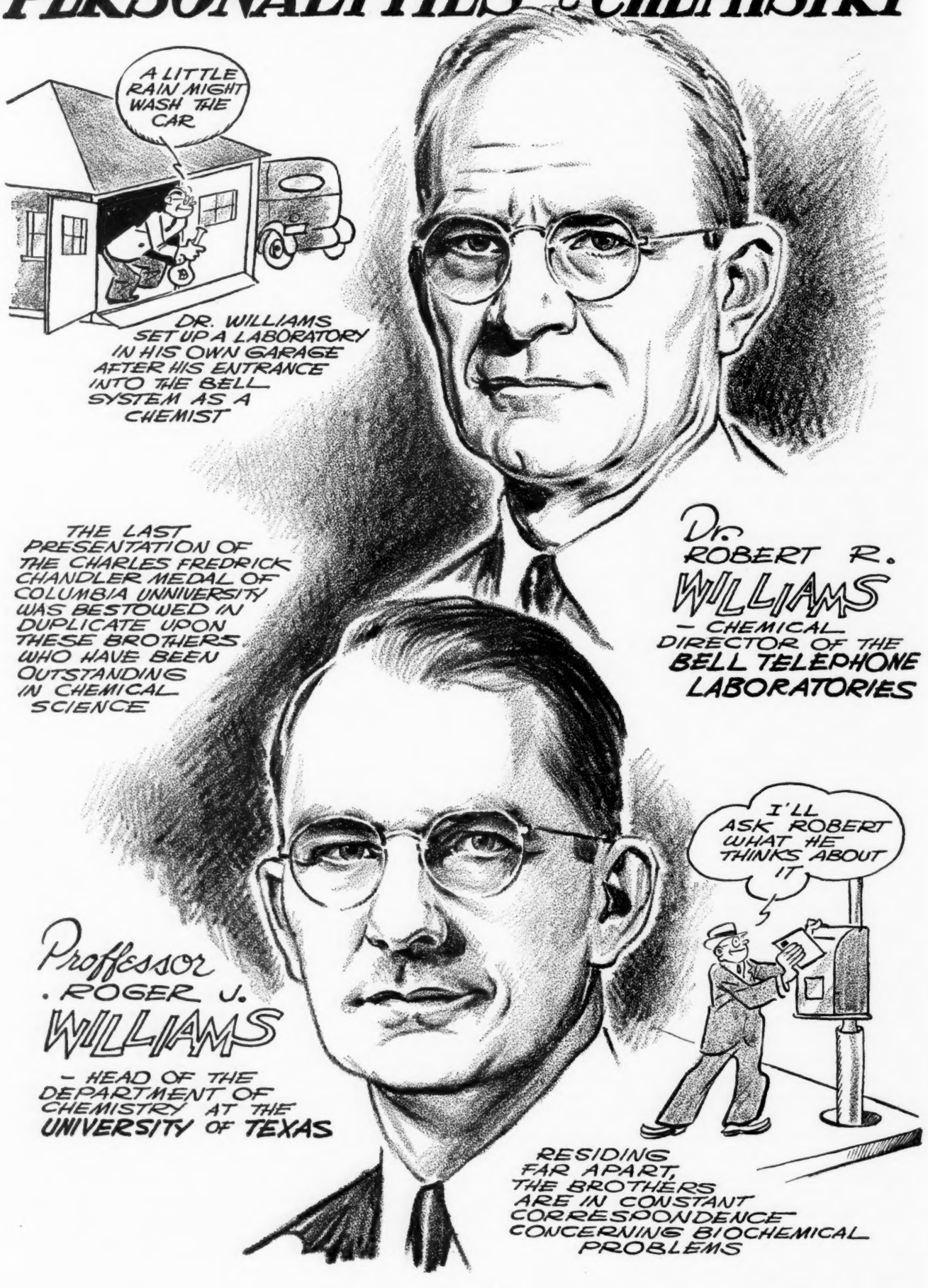
While the views as to the near future production do not contemplate any vast new industries, this may be short-sightedness on the part or the writer. If the reader reaches another conclusion then the problem of location becomes of primary importance. Now is the time to give consideration to that factor somewhat as discussed above for branch plants.

At the present time when production is at its maximum it is not easy to undertake some of these studies. It must not be lost sight of, however, that a great deal of this preliminary work of assembling information can be carried on by the maximum utilization of existing organizations, divisions and units. The earlier the assemblage of facts is begun the more this burden can be spread and without serious interference with the main problem of daily production.

The emergency we now face is bound to result in a new standard of service to customers. These latter are going to be forced to get along without a lot of expensive fads and frills. It is most important that these changes be catalogued and considered very carefully and that a concerted effort be made to prevent their re-entrance into post-war business. The appraisal must be done in a most careful manner so as not to overlook the absolutely unnecessary and to improve and make more efficient the necessary and advisable. There are real savings to be made in the conduct of business by proper appreciation of this particular phase, and this is an unusual opportunity to study effects.

The writer's observation based upon many years of travel in many parts of the world, has long led to the conclusion that American industry is rather provincial in its views. In fact the native born American is very provincial and since industry is nothing more than an organization of individuals it is natural that this trail follows through. Our industry has never paid enough attention to its public relations here at home to establish its right to a fair hearing in its own country and over the years has slowly lost its most valuable asset, public confidence and political respect. Perhaps it has spent too much of its time in perfecting its internal organization, has been too non-cooperative in its own field and has considered its sole service to the public as ended when it has originated and made available to the consumer a superior product. It has been too narrow-minded and provincial to see that this is only a part of its function and that it owes more than that for its right to exist. In consequence demagogues have taken advantage of this selfishness and have brought into being regulation out of all character, legislation of the most partisan character and prohibitions that unless changed will in time bring about its destruction. To go back and rebuild the damage of many decades is an enormous task. On top of this we now face this catastrophic situation brought about by a second World War within a generation. This is the real challenge to industry and the courage and effectiveness with which it meets this new situation is going to determine its future. Will we equal the challenge?

PERSONALITIES in CHEMISTRY


A LITTLE RAIN MIGHT WASH THE CAR
DR. WILLIAMS SET UP A LABORATORY IN HIS OWN GARAGE AFTER HIS ENTRANCE INTO THE BELL SYSTEM AS A CHEMIST
THE LAST PRESENTATION OF THE CHARLES FREDRICK CHANDLER MEDAL OF COLUMBIA UNNIVERSITY WAS BESTOWED IN DUPLICATE UPON THESE BROTHERS WHO HAVE BEEN OUTSTANDING IN CHEMICAL SCIENCE
Dr. ROBERT R. WILLIAMS – CHEMICAL DIRECTOR OF THE BELL TELEPHONE LABORATORIES
Professor ROGER J. WILLIAMS – HEAD OF THE DEPARTMENT OF CHEMISTRY AT THE UNIVERSITY OF TEXAS
I'LL ASK ROBERT WHAT HE THINKS ABOUT IT
RESIDING FAR APART, THE BROTHERS ARE IN CONSTANT CORRESPONDENCE CONCERNING BIOCHEMICAL PROBLEMS

THE WILLIAMS BROTHERS

THE last presentation of the Charles Frederick Chandler Medal of Columbia University was unique in that it was bestowed in duplicate upon two brothers outstanding in chemical science—Robert R. Williams, chemical director of Bell Telephone Laboratories, and Roger John Williams, head of the department of chemistry at the University of Texas.

Although Robert, the elder by some eight years, is known to the public for an outstanding piece of research on vitamin B_1, he has at the same time contributed to industrial chemistry through his leadership of an organization of 140 workers in Bell Telephone Laboratories, of which he has been chemical director for the past seventeen years. Roger is known as the father of vitamin analysis of foods and tissues by the use of microbiological techniques. Both were born in India, sons of a Baptist missionary, and both returned to the United States for their education, taking similar courses, in part, at the same institutions.

After graduating in chemistry from the University of Chicago in 1909, Robert entered the Philippine Civil Service at Manila. The Orient was ravaged then and even now, by a malady known as "beriberi"—a disease of the nerve tissues accompanied by extreme muscular weakness. It was observed that the disease was most common among those who ate polished rice, and this had led to the idea that the rice polishings contained something that would combat beriberi. The subject seemed to challenge Williams and he found himself impelled by the same motives that sent his father to India—the belief that through practical application of his chosen profession he, too, could benefit the Orient. Accordingly, Dr. Williams took up the study of this factor, consisting principally in a search for a rapid and reliable means for extracting it and for methods of testing the extracted product to see if the factor were present. This search lasted for twenty-six years. It was often interrupted and during much of the time it was carried on as a leisure-time pursuit entirely at Dr. Williams' own expense. After his entrance into the Bell System as a chemist, he set up a laboratory in his own garage; later in the old building of the New York Hospital; and, finally, through the courtesy of Dr. W. H. Eddy, laboratory space and animal quarters were made available at Teachers College, Columbia University. Funds were obtained by private economies or through gifts, though in later years the work was supported for some time by the Carnegie Corporation. Finally, in 1933, he was able in the semi-works laboratory of the Chemical Engineering Department at Columbia to enlarge the application of his procedure to furnish yields of about five grams of pure vitamin per ton of rice polishings and to produce about twelve grams of vitamin crystals.

By

A. D. McFadyen

In order to determine the structure of the vitamin it was necessary as in the case of other unknown organic substances, to split the molecule progressively into pieces small enough to be recognized as previously known substances. Knowing the identity of each fragment it was then hoped to learn how to put them together again to synthesize the original vitamin. In these phases of the project Williams enlisted the services of several workers who each contributed ideas and skill, as well as labor, in this study of structure and synthesis.

Over a period of two to three years Williams and his collaborators had worked up several tons of rice polishings in 300-pound lots and had largely determined the structure of the isolated fragments obtained by a novel cleavage of the vitamin molecule. In October, 1935, Dr. Williams entered into a cooperative arrangement with the Research Corporation and Merck & Company, Inc. In this way large scale technical facilities and the assistance of additional skilled organic chemists became available. The Williams extraction process had already been undertaken on a large scale and was providing material for the experimental investigations of Williams and his co-workers, thus resulting in the speeding up of the translation of Williams' dream into reality. Further cleavages of the vitamin and the comparison of the fractions with artificially synthesized substances of kindred nature gradually provided the missing details which permitted the complete formulation of the vitamin and the structure proposed was soon confirmed by a synthesis devised by Williams and Joseph K. Cline.

During most of those years, Williams, as chemical director of Bell Telephone Laboratories, has headed a growing and very productive group of chemists. Among their problems have been the metallurgy of magnetic alloys, of lead alloys for cable sheath and solder, and of vacuum-tube materials; an extensive study of the insulating properties of rubber and gutta percha, leading to the new material "paragutta"; studies of fungus toxins to retard decay of telephone poles; evaluation of finishes for wood and metals; and the development of rapid analytical techniques particularly in micro-chemistry. The work of the laboratory under Williams is reflected in literally hundreds of U. S. patents and professional papers. More than a dozen of these patents have resulted from Williams' personal contributions to these studies.

Dr. Williams is a co-author of the book "Vitamin B_1 and Its Use in Medicine," published in 1938, and author or co-author of five professional

(*Continued on page 413*)

This was first presented at the Boston meeting of the A.I.Ch.E. in May. In it, author has presented the recent history of hydrogen chloride synthesis. Alternative methods of production are discussed and their utility analyzed. Also included are methods for obtaining pure HCl from dilute or impure mixtures and a process based on the formation of copper sulfate hydrogen chloride.

anhydrous HYDROGEN CHLORIDE GAS

By A. H. Maude

Hooker Electrochemical Company

THE purpose of this paper is to discuss the production of pure hydrogen chloride gas by two processes: (1) direct synthesis, (2) concentration from weak or impure gas by means of a dry absorption process.

Hydrogen chloride is coming into prominence as an industrial chemical. It can be used for certain reactions when muriatic acid is unsuitable. Such purposes include the production of vinyl chloride from acetylene, alkyl chlorides from olefins, separating cotton from wool in reworking shoddy, production of arsenious chloride from arsenious oxide, and delinting cottonseed. An interesting minor use is the treatment of cotton seeds to cause them to germinate more quickly and perhaps grow two crops a season in places where only one is possible otherwise. Hydrogen chloride is also needed for production of liquid anhydrous HCl.

There are other reactions where the use of hydrogen chloride is preferable to the use of muriatic acid. Such reactions include preparation of various metallic chlorides from oxides, saccharification of wood, preparation of chlorides from alcohols, and amine hydrochlorides. It would, therefore, appear opportune to examine processes for the production of hydrogen chloride in a state of sufficient purity for use in these reactions.

Synthesis of Hydrogen Chloride

A reference on the synthesis of hydrogen chloride from chlorine gas and hydrogen gas is found as early as 1878 in Roscoe & Schorlemmer's treatise on chemistry, and in 1881 in Arendt's "Technik der Experimentalchemie." These authors describe laboratory experiments only. The process is perfectly simple when conducted on a laboratory scale. The gases are merely burned at the tip of concentric glass tubes which are enclosed in an outer glass tube. Only on a very small scale is glass equipment usable. Difficulties begin to mount as the scale of apparatus is increased, and we very soon encounter the problems of heat disposal and materials of construction.

In 1895 Isaiah H. Roberts[13] filed a patent application describing a manufacturing plant. In this patent he does not reveal the materials of construction used, or the method of dissipating the heat. It is believed that his process was in operation on a fairly large scale for some years. It would seem that he probably used refractory materials, such as silica, in which to burn the gases and may have used merely sufficient length of silica pipe to dissipate the heat. Such apparatus undoubtedly has been used, possessing the chief defect that it cannot be made airtight. If operated under any pressure whatsoever, objectionable quantities of gas escape. If operated under suction, air leaks in. This is objectionable, in that the gas is diluted and also, if excess hydrogen be used in the burner, an explosive gas mixture results in absorption equipment. If no excess hydrogen be present, then some extra chlorine, often an undesirable impurity, must be present, because absolutely perfect gas proportioning has never been accomplished, and for another reason discussed later in this paper. Another objection to such a burner lies in the fact that in spite of all precautions, considerable breakage of silica piping occurs, due to thermal strains during starting up and closing down of the operation.

In the year 1900 Pataky[12] filed an English patent wherein he uses a charcoal catalyst preliminarily heated and subsequently cooled by means of a water bath. Now it seems certain that no catalyst is needed or desirable. The temperature attained in the reaction is in any case that due to the heat of formation of HCl. To keep a catalyst bed cool would require an impracticable amount of cooling surface on any considerable manufacturing scale.

† Throughout this paper the term "hydrogen chloride" signifies the pure anhydrous gas, as distinguished from the aqueous solutions called "muriatic acid."

At a later date, Garner & Clayton[5] revived this idea, but its particular merits are not apparent.

The next contribution came from Gibbs[9] in 1905. He conducted the reaction with excess hydrogen in a brick combustion chamber, preheating the hydrogen to 300°C. The preheating is advantageous in that the flame starts up spontaneously upon admission of the chlorine, so that temporary interruption of gas flow does not tend to fill the apparatus with an explosive mixture. However, all the heat added to the hydrogen must be removed subsequently from the HCl gas with the combustion heat. Heat removal is one of the major difficulties in this synthesis, and the fact that the furnace is brick lined increases the difficulties of heat removal inasmuch as brick is a poor conductor. However, brick has the advantage of being very resistant to moist HCl gas, as well as to heat. In such an apparatus, the difficulty of heat removal is simply passed on to another piece of equipment. The larger the scale of operation, the greater are the difficulties of heat removal.

In 1922 Townsend[15] filed a patent describing a process in which chlorine is burned in an excess of hydrogen, the HCl absorbed and the excess hydrogen recirculated. The process is therefore unsuitable to the production of pure concentrated HCl gas. He also uses a refractory tube in which to burn the gases, and the main merit of his invention lies in the elimination of the exact proportioning of chlorine and hydrogen, inasmuch as the excess hydrogen is continually caused to recirculate. Hydrogen is added automatically as needed to maintain a certain pressure.

In 1921 Moore[10] described a synthetic hydrogen chloride plant which was operated with excess hydrogen. The proportioning was done by taking the hydrogen directly from a larger number of electrolytic cells than the chlorine. The burner itself was of quartz and the furnace was bricklined. A silica tube cooler was used for the gas which was subsequently further cooled in a stoneware spiral.

The next marked advance was due to Bauer.[7] He utilized an all-metal construction for the burner which was water-jacketed. He states that the burner is constructed of a resistant metal such as copper or its alloys, or lead. It is to be presumed that Bauer stipulates a "resistant" metal in order, as far as possible, to mitigate corrosion resulting from condensation of acid dew. Apparently Bauer realizes the danger of due formation, for he operates the jacket at a temperature of 80°C. Furthermore, he avoids burning up the tip of his burner by admitting the gases at a high velocity, which presumably keeps the flame suspended away from the burner.

The advantages of metal construction are obvious. The apparatus can be made absolutely gas-tight, which is impossible with ceramic or silica equipment subjected to temperature changes. In addition, breakage is eliminated and the greatly superior thermal conductivity of metals permits heat removal in a small piece of apparatus.

Stolzenberg[14] has a German patent on the combustion of chlorine and hydrogen at a high pressure for direct liquefaction of the HCl produced.

The above survey indicates among the problems confronting the designer of a synthetic HCl plant:

(1) Materials of construction for the burner
(2) Materials of construction for the combustion chamber
(3) Materials of construction for the cooler
(4) Method of proportioning the gases
(5) Method of igniting the gases
(6) Means for heat removal
(7) Safety precautions
(8) General design

Materials of Construction

The earlier inventors, who used silica and brick construction for the burners and combustion chambers, appear to have adopted this somewhat unwieldy equipment because of its resistance to moist HCl and to high temperatures. At first sight this might appear logical, since the burner is subject to moist HCl whenever it is shut down and allowed to cool, and to high temperature if not adequately cooled. But it seems more practical when working on a large scale to avoid these conditions than to provide against them.

Metal construction for the burner and combustion chamber has some very definite limitations which can be met by suitable design. First the metal must be kept cool, since the theoretical flame temperature is about 2100°C., which would melt any ordinary metal, at a much lower temperature the metal is corroded by the HCl or by any impurities in it, such as water or chlorine. Second, the metal must be warm enough to prevent condensation of dew. This "dew" is a saturated solution of HCl in water and forms at a much higher temperature than that at which pure water would condense. Figure 1 shows the dew points of HCl-H_2O-air gas mixtures as a function of the partial pressure of H_2O, referred to a glass surface. These curves were derived from data in International Critical Tables, but in view of the necessarily somewhat indirect method of derivation, a few points were checked by experimental work using a gravimetric method of moisture determination. These determinations in all cases, checked reasonably well with the published data. In metal construction the dew point is still higher, due to the fact that the condensate practically always is saturated with the chloride of the metal of which the equipment is constructed. We have found that a third factor, raising the lower limit of the temperature at which corrosion due to aqueous acid occurs, is adsorption of a liquid phase on the metal surface.

The above discussion tends to indicate that almost any common metal can be used within certain temperature ranges, depending on the moisture content of the product, which, in turn, depends on the moisture and oxygen contents of the chlorine and of the hydrogen. The allowable temperature range is influenced by the extent to which the chloride of the metal used tends to be hygroscopic. Thus iron can be used safely 30°C. above

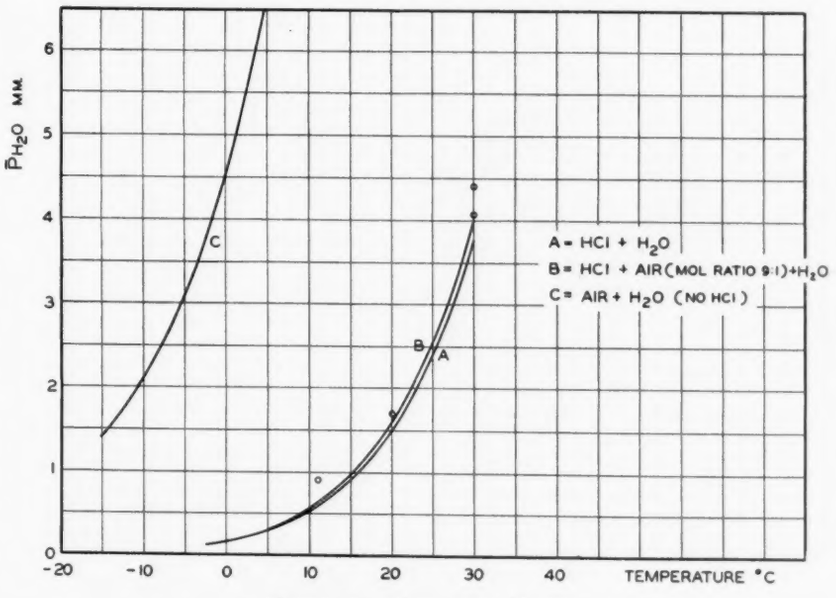


Figure 1. Dew Point Curve

the HCl-H_2O dew point, since ferric chloride is very hygroscopic, but copper may be used only 5°C. above the dew point. It is obvious that for best results a fairly uniform jacket temperature must be employed which can be attained by a rapidly circulating cooling medium. It is also obvious that the apparatus must be so designed that every part of the metal is jacketed by this medium to avoid any spot reaching a temperature which is high enough or low enough to cause corrosion.

Choice of the material of construction for the cooler is more difficult if the gas must be cooled to a temperature below the dew point. In this event the gas must pass to some non-metallic material, such as glass, stoneware, impregnated graphite or silica, although tantalum ma be used.

Gas Proportioning

The problem of gas proportioning is a purely mechanical one and will not be discussed here beyond mentioning the grave consequence of a producing system swinging over from excess hydrogen to excess chlorine. If this happens and the gas is being used in an absorber or some chemical reactor consuming the HCl only, we are left with an atmosphere of chlorine plus hydrogen (left from HCl gas preceding the change) which is spontaneously explosive.

Method of Ignition

Igniting the gases in the burner may appear a very simple matter to those who have not worked on this problem. In practice, it occasions some difficulties. The literature describes igniting the mixture by means of a burning oily rag, an electric spark, or a strong light. None of these methods is entirely satisfactory. A burning rag is extinguished in an inert atmosphere, as of hydrogen chloride. An electric sparking device is destroyed by the high flame temperature, and electrical connections are troublesome in the vicinity of HCl fumes which so readily condense a highly conductive dew. Our own experience with a light has been quite unsatisfactory, although others report it to be dependable. Of the alternatives that have been suggested, perhaps the most practical is the use of a retractable blow-torch, providing an air-hydrogen flame. Such a flame will persist when plunged into an inert atmosphere and is a positive method of ignition. Some care is required in design to insure a flame perfectly persistent both in the air when first lit and in the inert gases in the combustion chamber, as well as during the period while it is forced into the combustion chamber through a well-fitting gland. The other alternative involves the use of some material that spontaneously inflames in chlorine. The choice of material is not quite so easy as it appears at first sight. A powder cannot be used as it cannot be conveniently supported in the gas stream. A great many materials, stated in the literature to be spontaneously flammable in chlorine gas, fail in practice, as they do not work in a rapid stream of chlorine or in a mixture of chlorine and HCl. It is highly important that the operator ignites the gas as soon as it enters the combustion chamber and does not let an explosive mixture accumulate.

Means for Heat Removal

It is necessary to remove heat from the wall of the combustion chamber to avoid overheating to the extent of damaging it. It is also generally necessary to cool the gas before it can be utilized. Heat is satisfactorily removed from the combustion chamber by a warm water jacket in which the water circulates to avoid cold spots where dew could condense.

Heat can also be removed without any jacket by radiation, but then much more surface is needed, particularly as the metal close to the flame generally needs protection from an excessive temperature by a brick lining.

Safety Precautions

It has been said that all synthetic HCl plants blow up sooner or later. This is probably true. An operator will be careless, or some unforeseen event will occur. It is therefore necessary to protect the equipment by a variety of safety devices. Hydrogen and chlorine are said not to explode in the dark. In clean glass tubes of small diameter they do not. In large, plant-size, metal vessels they do. In unglazed ceramic vessels they do. We have considered it sometimes absolutely necessary to construct the apparatus in such a way that no serious harm is done if an explosion does take place. This means provision of a large frangible disc close to, and in a straight line from the normal location of the flame. After many experiments, a suitable diaphragm was worked out.

Another necessary precaution is a device to prevent an explosive mixture from being delivered in place of hydrogen chloride. This consists of an ignition device in the combustion chamber or in the outlet pipe. Such a device may consist of an electrically heated resistance wire in a silica tube.

Failure of either the chlorine or hydrogen gas supply, or of cooling water, must be anticipated. If suitable precautions are not taken, one gas might fail, extinguishing the flame, and then start flowing again to form an explosive mixture. A reliable emergency system has now been worked out which will do the following jobs quite automatically and independently of an electric, air, or other service line.

If the hydrogen supply fails:

1. The chlorine feed is cut off.
2. If hydrogen supply is resumed, neither it nor the chlorine can re-enter the system until the operator has taken certain steps.
3. Partial vacuum resulting from sudden extinction of the flame is prevented in order to avoid a suck-back of gas from point of use into the burner.

If the chlorine supply fails:

1. The hydrogen is cut off before all the chlorine in the equipment is consumed, so that the system cannot be charged with potentially hazardous hydrogen.
2. If the chlorine supply is resumed, it cannot enter the burner, nor can the hydrogen enter the burner until attended to.
3. Partial vacuum resulting from the flame extinction is taken care of as above.

These devices may be set so that in all cases an excess of hydrogen remains if the gas is supplying some reaction in which chlorine constitutes a hazard.

A very important precaution is to provide the combustion chamber with a liquid seal which will blow at a lower pressure than that of the hydrogen supply or of the chlorine supply, in order to be absolutely certain that neither gas can flow back into the line delivering the other gas, as this might lead to a particularly dangerous condition.

In the event of failure of cooling water, there is danger of burning up the equipment rather quickly. Therefore, depending on the nature of the water supply, a no-pressure alarm can be installed on the water line, or an emergency water storage reservoir may be provided.

In many cases it is necessary to provide for the sudden closing off of the HCl delivery pipe. This can be done by means of the above mentioned liquid seal.

One further precaution, which may appear excessive but is certainly justified in some installations, consists of connections to permit blowing out the entire combustion chamber with CO_2. The CO_2 atmosphere is entirely safe, whereas purging with air or chlorine leads to a potentially explosive atmosphere in the event of the presence of hydrogen. Purging with hydrogen leads to a potential hazard in the event of in-leakage of chlorine or air. Purging with chlorine, furthermore, creates discomfort for the operators when the apparatus is opened.

Although these precautions may seem excessive in some cases, the production of many hundreds of tons of anhydrous hydrogen chloride from this potentially very explosive combination of gases without an accident seems to justify the devices.

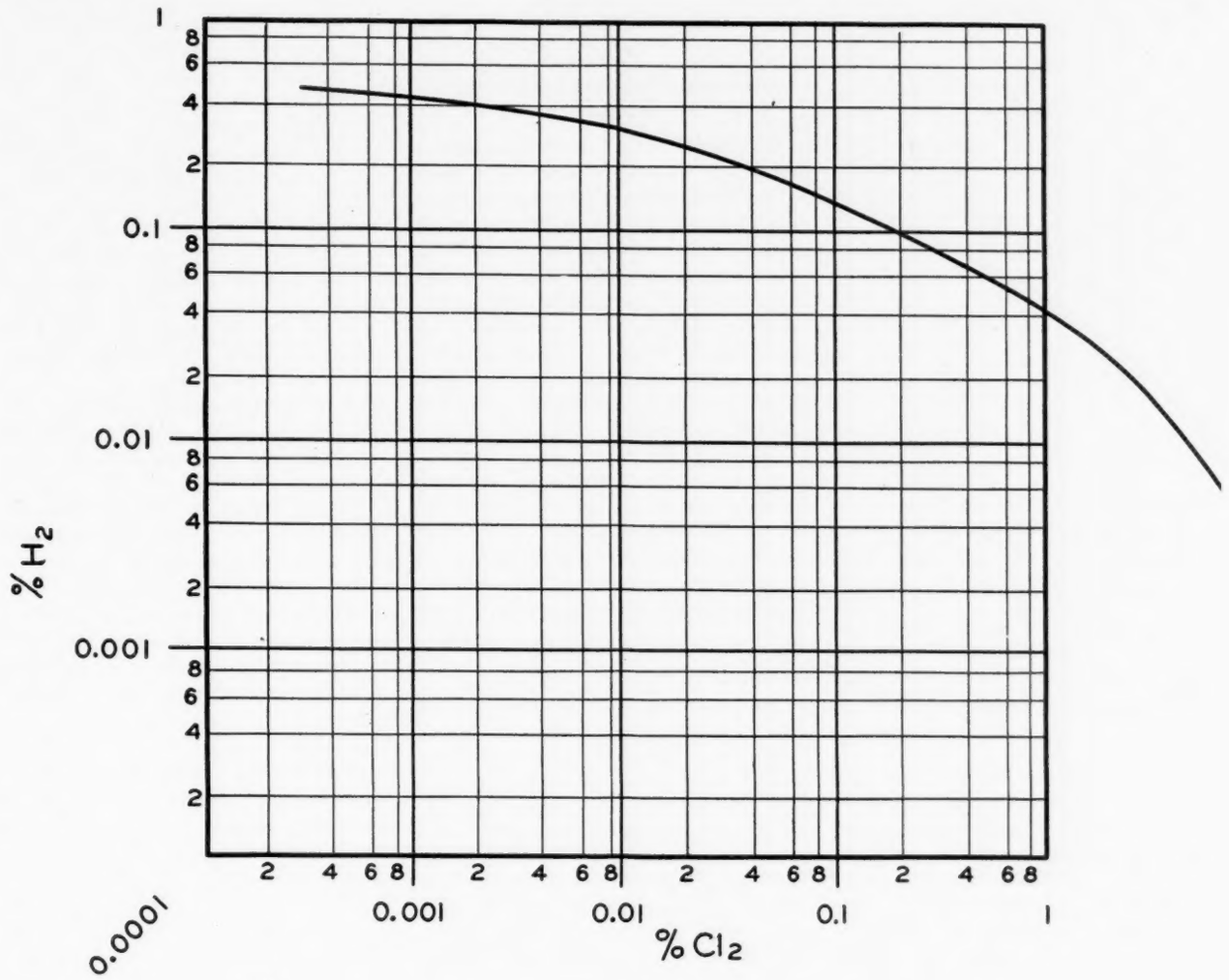


Figure 2. Excess Hydrogen vs. Chlorine Ratio

General Design

The general design involves such features as are needed to accomplish the aims already set forth. In addition, it is necessary to provide such accessories as sight glasses, connections for purging with inert gas, connections for draining out any condensate inadvertently formed, manometers, thermometers, and so on. The apparatus is illustrated in Figures 3 and 4. Such a large-scale plant has been continuously operated for many months with almost no interruption. The attention given is that of one operator about ten minutes every two hours. The analysis is over 98 per cent all the time and over 98.5 per cent most of the time.

If still purer hydrogen chloride is desired, an automatic analyzer may be used which automatically adjusts the gas flow. A pilot plant has been in operation with such a scheme and the analysis of the gas was held at 99.0 to 99.5 per cent when using evaporated liquid chlorine. Hydrogen chloride made by this method containing less than 0.5 per cent excess hydrogen, has detectable traces of chlorine in it in accordance with Figure 3.

Purity of Synthetic Hydrogen Chloride

The impurities present in small amounts in the hydrogen are nitrogen, oxygen and moisture. In the chlorine there may be nitrogen, oxygen, hydrogen, and carbon dioxide. If "blow gas" chlorine* is used, the impurities may amount to 50 per cent of the gas by volume. The effect of moisture has already been discussed with respect to its corrosive action upon the equipment. Moisture in the hydrogen and the chlorine may be removed by driers if necessary. It may also be removed from the product by means of a drier, or fairly well by adequate cooling. The moisture remaining in the cooled gas is very slight, as is shown on the curve, Figure 1. Any oxygen present in the feed gases is converted to moisture during combustion. Carbon dioxide is reduced to some extent to carbon monoxide. Thus, synthetic hydrogen chloride made from typical evaporated liquid chlorine and electrolytic hydrogen analyzes as follows, expressed in volume per cent:

Hydrogen Chloride	99.00
Chlorine	none
Hydrogen	0.64
Nitrogen	0.20
Water Vapor	0.10
Carbon Dioxide	0.05
Carbon Monoxide	0.01
Total	100.00

The gas also contains 0.002 per cent by weight of ferric chloride if iron construction is used.

If a copper combustion chamber is used,

* Non-condensables saturated with chlorine at the pressure and temperature of the liquefaction process.

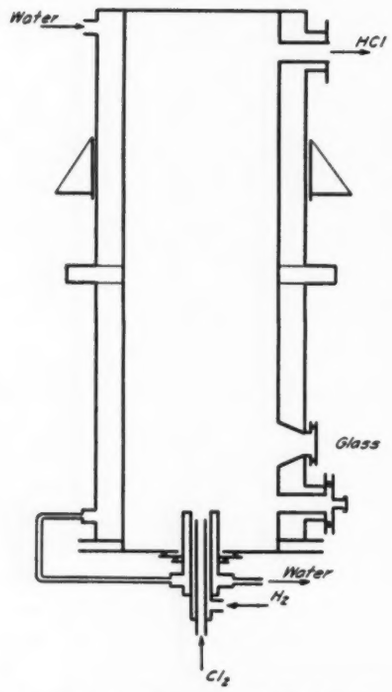


Figure 3. Diagram of Hydrogen-Chlorine Burner

there is no iron and less than one part of copper per million. The product is necessarily free of arsenic and sulfur compounds, and if absorbed in distilled water, yields an analytical reagent grade of muriatic acid.

The relation of the free chlorine to the free hydrogen in the product depends on design and output of burner and combustion chamber. Figure 2 shows this relationship for one particular installation.

Alternative Processes for Hydrogen Chloride

To discuss the place of the synthetic process for hydrogen chloride in industry, it is desirable to review briefly some of the alternative processes. Commercially possible reactions fall into the following classification: (a) Acid plus a metallic chloride, (b) Chlorine plus organic substances, (c) Chlorine plus ammonia, (d) Chlorine plus water, (e) Water plus sulfur dioxide and chlorine, (f) Hydrogen plus metallic chlorides, (g) Metallic chlorides plus water.

(a) *Acid plus a Metallic Chloride.*—Undoubtedly the process for hydrogen chloride most widely used in industry today is still the common salt-sulfuric acid reaction. This reaction may be carried to completion, producing salt cake, or halfway to the bisulfate state only. Thus:

$$NaCl+H_2SO_4=NaHSO_4+HCl$$

This reaction can be conducted in a closed retort and a fairly pure hydrogen chloride gas can be obtained.

However, sodium bisulfate has only limited uses; it can be further reacted with salt in a salt cake furnace, thus:

$$NaHSO_4+NaCl=Na_2SO_4+HCl$$

yielding more HCl and salt cake. But this second step in commercial forms of apparatus yields dilute HCl gas. If the reaction is carried only to the bisulfate stage, the principal limitations are: (1) By-product bisulfate needs further processing before it is marketable, (2) Twice the theoretical quantity of sulfuric acid is used, and (3) Hydrogen chloride produced is contaminated with sulfuric acid, and (4) Other impurities such as arsenic may come from the sulfuric acid used.

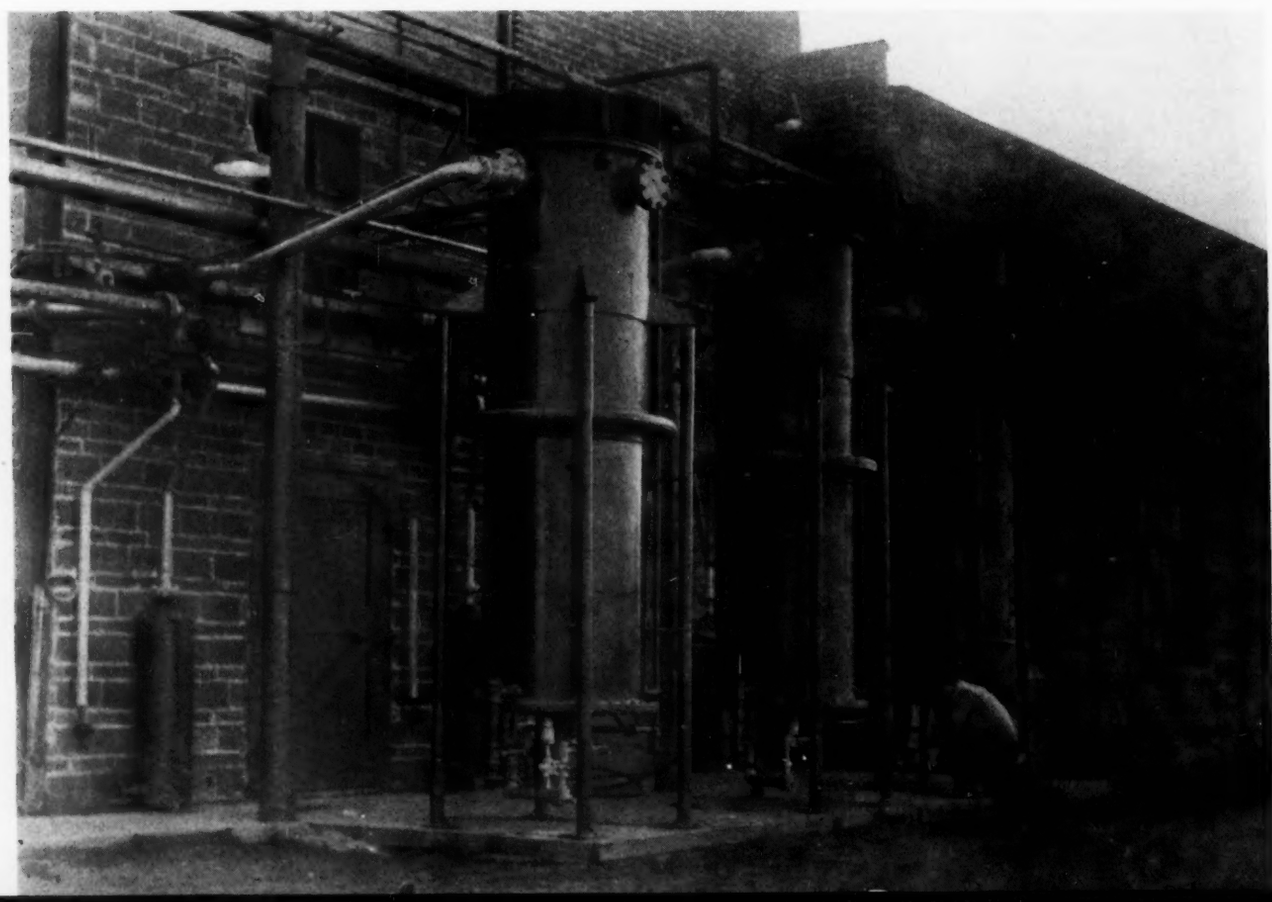
When the process is carried on to completion in one stage, the gas may be as dilute as 60 per cent, and thus need concentration. The problem of concentration will be discussed later in this paper.

As all industrial chlorine derivatives originate ultimately from sodium chloride, with the somewhat minor exceptions of KCl for caustic potash and $MgCl_2$ for Mg, the use of other chlorides could only be justified if they are by-products of little value. Calcium chloride is such a by-product, but as the calcium sulfate obtained has no value, its reaction with sulfuric acid is not economical.

One suggestion, which under some conditions might be useful, is the reaction with sulfuric acid of ferrous chloride originating from muriatic acid steel picking. In this case, the resulting ferrous sulfate has commercial value.

(b) *Chlorine plus Organic Substances.*—Large amounts of HCl are produced as by-product of the chlorination of organic substances, notably the low molecular weight paraffin hydrocarbons, and the simpler aromatic compounds such as benzene, toluene, and naphthalene. The gas produced is normally contaminated with organic products, chlorine, and air, less often with moisture. Such by-prod-

Figure 4. Bank of Hydrogen Chloride Burners. (Hooker Electrochemical Co.)



uct is often not well located or synchronized with respect to the demand for HCl gas.

Aliphatic hydrocarbons can be chlorinated with pyrolysis to yield HCl and carbon, but the product is contaminated with carbon, organic matter, and sometimes also with chlorine. The purification problem is quite serious but perhaps may be met best by the dry absorption system described below.

(c) *Chlorine plus Ammonia.*—We must not ignore the process of reacting chlorine with ammonia[11] at a high temperature. The result is somewhat diluted gas (85.7 per cent HCl). The reaction is:

$$2NH_3+3Cl_2=6HCl+N_2$$

But as the diluent is only nitrogen, the gas is usable for many purposes. The special utility of this process is for generation of the gas at locations remote from a source of hydrogen. Both chlorine and ammonia may be shipped as liquids in tank cars, but to ship hydrogen in quantity is impractical.

The reaction takes place spontaneously and completely, but great care must be taken to avoid mixing the gases at a temperature so low that the highly explosive compound nitrogen trichloride can form.

(d) *Chlorine plus Water.*—The action of chlorine on water to yield HCl is the inverse of the Deacon process for chlorine from HCl. To obtain complete and rapid reaction by supplying heat and avoiding an equilibrium condition while chlorine is still present, the reaction is carried on with the aid of carbon at a red heat, the carbon continuously combining with the oxygen liberated. The HCl produced is contaminated with oxides of carbon, water vapor, sulfur compounds from the coke used, and in general is not suitable for processes needing a high-grade gas.

(e) *Water plus Sulfur Dioxide and Chlorine.*—An interesting proposed method consists of reacting SO_2 and Cl_2 in the presence of moisture. Welch[16] reports that this reaction can be brought about to produce sulfuric acid up to 95 per cent concentration and HCl gas. In a similar process, the SO_2 and Cl_2 are first combined to make sulfuryl chloride which is later decomposed by steam. The particular merit of this modification is that the sulfuryl chloride can readily be stored and shipped, then decomposed when required. In view of the difficulties of storing SO_2, Cl_2, or HCl gas, this process may, under some conditions, have much to recommend it.

(f) *Hydrogen plus Metallic Chlorides.*—For the sake of completeness, the reduction of metallic chlorides by hydrogen gas to give HCl and reduced metal may be mentioned.

(g) *Water plus Metallic Chlorides.*—The action of water on aluminum chloride can yield pure dry HCl for laboratory purposes.

Concentration of Impure HCl Gases

Distillation of Muriatic Acid.—The principal commercial method today of concentrating HCl is to absorb it in water to obtain a concentrated solution. This solution is distilled until a constant boiling mixture (20 per cent HCl) is approached. The vapors are cooled and moisture condensed from them. This condensate and the liquid in the still are cooled and again saturated with HCl gas. The gas is finally dried by sulfuric acid. The difficulties of this process lie in materials for construction.

In general, non-metallic materials are used, although tantalum is quite suitable for the steam tubes to vaporize the acid. Material for other parts of the equipment may be ceramic, impregnated carbon, or impregnated graphite, glass, and where not subjected to temperatures above 90-100°C., rubber or one of the synthetic rubbers. Although all the problems are believed to have been solved, the difficulty inherent in the materials of construction must not be minimized, particularly if the apparatus is operated much above atmospheric pressure.

Desorption from Addition Compound.—An alternative method of concentrating HCl gas having commercial promise does not involve the use of aqueous solutions and may be conducted entirely in iron apparatus, provided the gas is dry to start with. This method consists in absorbing the gas by a metallic salt capable of retaining HCl in a manner analogous to the addition of water of crystallization by some anhydrous salts. The compound may then be heated to desorb or "strip" pure hydrogen chloride from the non-volatile salt, and the latter reused to repeat the cycle indefinitely.

A great many sulfates are capable of forming such hydrochlorides. Among those worthy of consideraton may be mentioned lead sulfate and copper sulfate. Certain phosphates such as ferric phosphate also react in this manner.

The action of hydrogen chloride on anhydrous lead sulfate was investigated by Colson.[2] He found that the gas is absorbed and deduced the "formation of a sort of chlorhydrate more or less definite and susceptible to vapor evolution." He also discusses the possibility of a reversible reaction producing lead chloride and sulfuric acid. He investigated absorption of hydrogen chloride by copper sulfate and determined vapor pressures of the resulting compound. From observation of color changes, he concluded that copper chloride might be formed.

Hensgen[7] and Kane[8] prepared copper sulfate dihydrochloride in a pure condition by absorbing hydrogen chloride on anhydrous copper sulfate until saturated. Hensgen analyzed the product and found the composition to be $CuSO_4 \cdot 2HCl$. He also observed that the HCl is readily evolved by heating. He speculated as to the true composition of the product. It was $CuSO_4 \cdot 2HCl$ or $CuCl_2+H_2SO_4$. He suggested that part of the copper sulfate had decomposed to copper chloride.

A substantial contribution to our knowledge of compounds capable of evolving HCl by heat was made by Ephraim.[3,4] He found that not only lead sulfate and copper sulfate may be used, but also the sulfates of cadmium, silver, mercury, tin, bismuth, antimony and thalium, also certain phosphates and phosphites. In each case he determined the composition of the product and in most cases the temperature of evolution of hydrogen chloride. In the case of the copper sulfate compound with hydrogen chloride, he finds that 1.5 moles of HCl are lost at 83°C., but that ¼ mole is retained at 100°C. In the case of lead sulfate, he also finds that $PbSO_4 \cdot 2HCl$ is formed. One and a half molecules of HCl are lost at 32°C. The balance is not completely removed, even at 100°C.

Although the hydrochloride of copper sulfate[3,7] has been described as readily produced by the action of HCl gas on the anhydrous salt, this does not seem to be universally true, since some samples of anhydrous copper sulfate are found to absorb HCl only extremely slowly and incompletely. Among the factors influencing the rate of absorption, the most important is the temperature at which the salt is dehydrated. The product is a brown powder instantly decomposed by water. In appearance and feel it is slightly moist, which has led to the conclusion that it contains free H_2SO_4. The empirical formula, $CuCl_2 \cdot H_2SO_4$, is identical with that of $CuSO_4 \cdot 2HCl$. It is probable that this powder contains a small amount of the former composition. The compound is decomposed by gentle heat to HCl and $CuSO_4$. It will be noticed that either of the above formulae might decompose in this way. The heat of absorption of HCl by $CuSO_4$ is very large, approximating the heat of solution of HCl in water. As the temperature of the compound is raised, the vapor pressure of HCl increases. We have been unable to regard this pressure as a constant and fixed property of a definite chemical compound. The pressure of HCl decreases gradually as desorption proceeds under isothermal conditions. A temperature of 130°C. is needed to obtain desorption at atmospheric pressure, but it was found that initially a vapor pressure of one atmosphere is attained at 90°C.

For practical reasons it is expedient to disperse the compound over a carrier, since the gas cannot be passed through the powder in any convenient commercial apparatus. One possible method of handling the material is to mix it with

some clay or clay-like material and then dehydrate the clay and copper sulfate together by baking. Various other absorbent materials may be used, observing the principle that for practical plant design, it is very important to obtain the maximum amount of copper sulfate in the minimum volume. The cost of the plant is influenced to an enormous extent by the volume of absorbent used and by the amount of heat transfer surface provided. After many trials, an absorbent has been found which offers negligible resistance to gas flow, absorbs 14 pounds of HCl per cubic foot, and does not deteriorate on repeated reuse. It is sufficiently strong to be handled and not to disintegrate in use. This mass requires neither refrigeration, nor temperatures in excess of those obtainable by steam at usual pressures.

In the course of the investigation, a great deal of trouble was encountered by deterioration of absorptive capacity. In some instances when clay was used, there appeared to be a metathetical reaction between aluminum silicate and copper sulfate. Another hypothesis is that H_2SO_4 is always formed and in some cases seeps away from the copper salt. If copper sulfate-hydrochloride can dissociate to a slight extent to copper chloride and H_2SO_4, this reaction might reverse itself at higher temperatures if the H_2SO_4 remained where liberated. But if its micro distribution were changed, the reverse reaction could not occur to completion.

Volatile organic substances such as issue from hydrocarbon chlorinators appear to be without influence on this process. As the absorption proceeds at temperatures up to 70°C., the volatile impurities pass through unabsorbed. Moisture is very detrimental and a preliminary drying of the gas is sometimes necessary. Dilution of the gas markedly slows down the rate of absorption. The system works very satisfactorily with gases containing 50 per cent HCl or more, but it is very doubtful whether the plant would prove economical for the concentration of gases initially below about 25 per cent HCl. Furthermore, it appears to be commercially impracticable to completely absorb the HCl by this method and consequently small quantities, say from 1 to 5 per cent, are permitted to pass through unabsorbed, but may, if justified economically, be caught in a water scrubber as muriatic acid.

The gas liberated is so free of inert diluents that they are undetectible by the ordinary analytical procedures. When this high degree of purity is desired, however, it is necessary to purge all inerts out of the absorption unit by venting some liberated gas at the beginning of the desorption cycle. This gas is being used for analytical purposes and is found to be completely free from metallic impurities. Even without the purging step, the gas will average better than 99 per cent HCl.

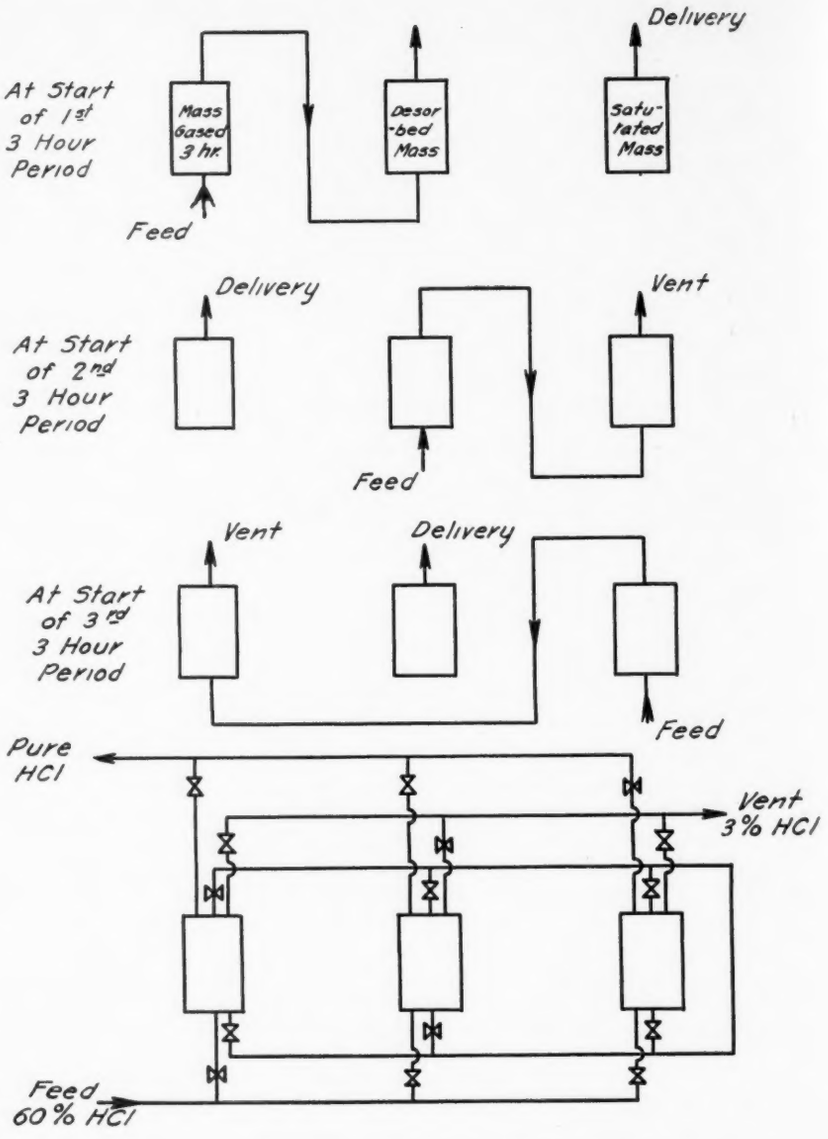


Figure 5. Flow Diagram of Dry Hydrogen Chloride Absorption System

The design of a plant varies greatly according to the practical conditions under which it is to operate. Such factors as concentration of the HCl fed to the system, the steam pressure available, the pressure on the raw gases, and the pressure desired on the purified gas, which may be two or three atmospheres or even higher if desired, affect the design of the plant to an extraordinary extent.

The actual plant is simple and takes the form of a shell and tube vessel to hold the mass. This is cooled by water during a six-hour absorption cycle and heated by steam during a three-hour desorption cycle. Figure 5 shows a flow diagram of a plant capable of continuous absorption of HCl from a 60 per cent gas (97 per cent of the HCl being absorbed) and continuous evolution of gas over 99 per cent hydrogen chloride.

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BETWEEN THE LINES

Now that you are familiar with rationing caused by war, you won't be surprised to learn that there probably will have to be some sort of rationing in the fertilizer industry. It is a fact that chemical nitrogen preparations will either be scarce or not obtainable at all in the coming months. Here is our special "inside Washington" report on what to expect.

ON the eve of widespread rationing in foodstuffs the question of the nation's fertilizer supply assumes first rank. While it is scarcely the case in this country that "Fertilizer will win the war" something approaching that state of mind is to be detected in reports from various countries abroad, enemy and friend.

In the United States as in the other countries referred to the crux is in the chemical ingredients which may or may not be available. While Americans are not surprised at mention of any shortages abroad, they are hard to convince that this nation is subject to some deficiencies of raw materials. Yet it is the fact that chemical nitrogen preparations will either be scarce, or not obtainable at all in the coming months. Some eastern retailers already have reported that they have not sold nitrate fertilizers since late summer.

The United States furthermore, is beginning to see a time when its farmers will be having a somewhat comparable experience, but on a decidedly less rigorous scale, to their fellows in certain other countries.

In some Scandinavian countries, according to report, a system of rationing fertilizer supplies of chemical base, according to a utilitarian system, has been invoked. Reports of a similar nature have been made from South Africa, and from England; how accurately they reflect conditions is of course, conjectural.

According to such reports however, fertilizer is apportioned according to the importance of the crop, and also as between crops all of which may be important, according to the seasonal demand for fertilizer—some crops may do better in a given season than others, and the latter would naturally be favored with any extra fertilizer aids. In some countries a form of subsidy exists, as an aid to farmers in meeting the war-born high costs of fertilizers or their ingredients.

Thus chemical components, where these must be imported, have been added to the other critical chemical materials entering the economy of friend and foe alike. In Italy, it is reported, as an illustration, the need of copper sulfate for sprays is so urgent that a system of recovering the substance from the leaves of the vineyards after the grape harvest, has been worked out. It is claimed that appreciable quantities of copper can be obtained by this method.

In still other cases reported, countries are seeking desperately to make themselves self-sufficient, or at least to meet deficiencies which threaten now to persist for an indefinite period.

A growing realization of the fertilizer situation in this country can be detected in recent actions by several Federal agencies. These acts relate to both price control affecting fertilizer components, including nitrogen, and conservation steps. Less well-publicized are experiments by the U. S. Department of Agriculture in developing new sources of critical substances, and in other preparations to meet war demands in this connection.

Federal actions in this field include an order of the Office of Price Administration in bringing sulfate of ammonia under the general price ceiling. This is one of the most vital ingredients of fertilizer. Because of its importance as a nitrogen carrier (it is the principal source of nitrogen in mixed fertilizers) it is under strict allocation. However, the various regulations apply primarily to the product carrying 20.5 percent or more of nitrogen, and which is applied directly to the soil as a fertilizer, or used in mixed fertilizers. Some of these regulations, by one or another of the war agencies, apply not only to sulfate of ammonia, but to by-product ammonias.

In this connection the country is fortunate that both this chemical, and superphosphates, are closely identified with the gigantic munitions program of the country. Sulfate of ammonia is a by-product of the iron and steel industry. The iron and steel industry of the United States is at least equal to a considerable part of the combined similar industries of Axis powers, and with allied production, undoubtedly on a par. Thus recovery of chemical products of this, and other uses, on a substantial scale would seem to be assured.

Superphosphates, in turn, are closely related to the sulfuric acid recovered from munitions production processes. The plight of less favorably situated areas in regard to this essential is illustrated by the case of South Africa. Before the war, this country imported 100,000 tons of superphosphates annually from the Netherlands.

The war led to heavy demands on the country's fertilizer industry, and the loss of the Netherlands as a source of supply for superphosphates, which was particularly in demand, resulted in a serious shortage. Important local manufacturers had in the past, been dependent on imported phosphate rock for their output of superphosphates. Only careful planning has enabled that country to meet the situation.

The bright spot, in one sense, for the United States, is in the fact of its large war output now. Largely as a result of the production of synthetic ammonia for munitions, the country will face the problem of a surplus once the war ends, in place of the present shortage. At least double the quantity of ammonia will be available then, compared to the present.

Meanwhile, in this country, there is in prospect a widespread resort to use of organic nitrogen. Farmers, especially those in the east, are being advised to plant nitrogenous cover crops and turn these under, thus getting some of their requirements.

Suggestions have been made that the chemical be extracted from bean meal (soy, etc.), and even waste stalks, such as tobacco stalks, as in the case of areas producing this crop. Some extractions have been undertaken, but not on the scale that appears likely at a later stage if the present outlook remains unchanged.

Some authorities maintain however, that the phosphate-potash mixture is just as effective for practical purposes, as when nitrogen is used in combination. It is now expected that sufficient potash can be reclaimed from domestic mineral sources to meet most requirements. It is planned to stimulate production from this source, also.

In this connection there has just been formed a Potash Advisory Committee, from the industry, to work with Federal agencies, including the following membership:

Horace M. Albright, United States Potash Company; Cecil B. Baker, American Potash & Chemical Company; J. B. Grant, Potash Company of America; James P. Margeson, Jr., International Minerals & Chemical Corporation, with T. E. Milliman of the Chemicals Branch of WPB as Government representative.

The prospect for a continued supply of nitrates from Chile is of course, a potent factor. If this expectation is realized, sufficient stocks will be available for next Spring's fertilizer needs. Rationing of Fall supplies is foreseen, however. The munitions requirements of nitrates comes first, in any case.

Washington

(*Continued from page 316*)

Order M-103 limits the quantities of anthraquinone dyes that may be used in the third quarter, as well as the amounts that may be sold and delivered. Users were also warned that any waste or excessive use of color might bring further reductions of dyestuffs quotas. New procedures for applying the high preference ratings assigned under Priorities Regulation 1 are necessary under a complete revision of that regulation by WPB. Priorities Regulation 1 also has been amended to change the order of ratings in the AA series; hereafter, all AA-1 and AA-2 ratings will be treated equally, neither having preference, and a new rating has been established, AA-2X, has been designated, which will come below AA-1 and AA-2, but will be higher than AA-3. The purpose is to give these older ratings a different value without necessity of re-rating outstanding assignments individually. A number of involved changes make a close study of this amendment necessary.

Under Priorities Regulation 14, hereafter whenever certain military requirements are involved, its provisions shall apply also to corresponding agencies of Canada.

Research laboratories processing $5,000 worth or more of metals per quarter, are required to file under the Production Requirements Plan, under an interpretation by WPB.

Preference Rating Order P-98, governing materials to the oil industry has been re-issued, without change, and will remain in effect to September 15, on recommendation of the Petroleum Coordinator.

Orange mineral (lead oxide) may be used as a pigment in printing ink without restriction under Amendment No. 1 to Conservation Order M-53. This amendment also permits unrestricted use of varnishes containing glycerol phthalate resins and phenolic resins in making gloss ink, scratch ink, or gloss overprint varnish if such varnishes were manufactured prior to March 30, 1942 for use in printing ink.

Sales and deliveries of volatile oils, such as peppermint and spearmint, by growers of the plants from which such oils were produced, are exempt from provisions of General Maximum Price Regulations under a ruling by OPA.

Cross-licensing and licensing agreements were approved by the Petroleum Coordinator for a number of companies in, or affiliated with the petroleum industry, to facilitate certain manufacture of toluene, aviation gasoline, and other war requirements.

Exportation of copper sulfate is prohibited under amendment to the general regulations of the Bureau of Economic Warfare.

Thermoplastics are put under further rigid control through amendment to General Preference Order M-154, and M-154-A, covering polyvyl butyral and products. Supplementary Order M-154-B is in this series.

Control over distribution of soluble nitrocellulose by WPB became effective August 6.

WPB on August 8, directed a reduction in amount of ethyl alcohol available for shoe polish and a corresponding increase in amounts available for vinegar.

Shipments of less than five tons of wood pulp in any calendar month have been exempted from restrictions under General Preference Order M-93.

Acetone, butyl alcohol and esters, have been added to products covered by the General Maximum Price Regulations.

WPB has announced its program for reclaiming war-essential solvents and oils, as outlined in this magazine in a recent issue. The anticipated recovery exceeds over one billion pounds, and ranges up to two billion. Owing to the drain on new critical materials, WPB urges that existing solvent and oil reclaimers be utilized, rather than resort to new equipment to augment the number of plants able to do this work. The WPB has issued a list of such firms. (Release WPB 1715.)

All priority ratings will be issued centrally through the War Production Board effective from September 7, thus terminating authority of Army and Navy procurement officers to assign priority ratings in the field.

Establishment of a Canadian division to handle Canada's priorities problems in the Office of Industry Operations of WPB was ordered by WPB August 31, headquarters to be located with the Dept. of Munitions and Supply, Ottawa.

Complete allocation of aromatic petroleum solvents other than benzol and toluol, effective October 1, has been ordered by WPB. Between now and September 30 deliveries will be limited to preference ratings of A-2 or higher. Allocation will not apply to users of less than 60 gallons per month.

Under interpretation No. 1 of L-171, Toiletries and Cosmetics, the word "product" refers to classes of toiletries and cosmetics rather than individual items and varieties coming within the classes, such as cleansing cream, which is a "product" but any person making two or more varieties is still making only one product for purposes of the order.

Two changes in M-196, soluble nitrocellulose provide for removal from restrictions such of the product suitable for dynamite manufacture, and removes undissolved film scrap from allocation control.

Under amendment to P-43 small research laboratories may use A-1a ratings to obtain reagent chemicals, and the order is extended to October 1. Amendment No. 2 to L-144 will exempt reagent chemicals from limitations of that order, while Amendment No. 1 to the same order exempts from its provisions orders placed by the armed forces and a number of government agencies concerned with research.

Purchase agreements between the Board of Economic Warfare and the Government of Brazil covering castor beans and babassu kernels are expected to augment badly needed oils to replace tung oil and coconut oil, cut off by war conditions.

Advisory committees have been designated for the coal tar distilling industry, potash producers' industry, and industrial alcohol producers, by WPB.

WPB Revamped

The anticipated revamping of the Chemicals Branch of WPB has been completed by Dr. E. W. Reid, Chief of Branch. Under this heading, Lawrence Brown becomes Assistant Branch Chief, in charge of staff sections.

The Aromatics and Intermediates Section will absorb the Plasticizers and Glycols unit, formerly in the Plastics and Resins Section, and this amalgamated group will be headed by Hugh D. Hughes, formerly of the Carbide and Carbon Chemicals Corporation, New York City. He succeeds in his WPB post James Reynolds, who now becomes Assistant Chief of the Chemicals Branch.

Dr. H. S. Coith, formerly Assistant Branch Chief, has returned to his regular civilian work at Procter & Gamble Company, Cincinnati.

The reorganization creates a new Transportation and Packaging Section, with Donald C. Knapp as chief. Mr. Knapp has been serving as special assistant to the Deputy Branch Chief, and came to WPB from his position as Manager of the Boston Branch, George Mann & Company, Providence, R. I. Chemicals distributors.

It creates also a new Plastics and Synthetic Rubber Section, consolidating separate units formerly in this field. Frank Carman, formerly head of the Synthetic Rubber Section, is chief of this augmented section. He is a rubber chemist, formerly chief of this work for Armstrong Cork, and comes from Barberton, Ohio.

Arthur Peterson, former Chief of Plastics and Resins, becomes the new chief of the Products Advisory Section of the Chemical Branch.

James Lawson, formerly with WPB's Special Industrial Machinery Branch before this was abolished, now heads the Projects, Machinery and Facilities Section of Chemicals Branch.

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Chemical Engineering at University of Wisconsin

CI's assistant editor Crowe, on a recent trip, took these photos at the Department of Chemical Engineering, U. of Wisconsin, at Madison.

Chemical Engineering at the University of Wisconsin was organized as a separate department in the early years of the present century by Dr. C. F. Burgess, who later became well known as the organizer and president of the Burgess Battery Company and of the C. F. Burgess Laboratories. Since its organization, the department has enjoyed a steady growth. During the academic year of 1941-42, the total undergraduate enrollment was 379, which, from the standpoint of number of students, ranked the department second in the group of five departments comprising the College of Engineering. Present indications point to an undergraduate student body of even greater size for the coming academic year. A marked decline in the number of graduate students is in prospect as a result of the directive denying deferment to Research Assistants other than those working on projects pertaining to the war effort, and guided by a governmental agency.

One year ago, the Wisconsin Alumni Research Foundation made a grant to the Chemical Engineering Department to finance a 10-year program of research. Dr. O. A. Hougen, for many years a member of the department, was chosen to head up this program. Recently, Dr. K. M. Watson has been added to the staff to participate in this program.

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(1) R. A. Ragatz, Chairman, Dept. of Chem. Eng. (2) O. A. Hougen, Professor of Chem. Eng. In charge of research program in Chemical Engineering sponsored by the Wisconsin Alumni Research Foundation. (3) T. C. Fong, Instructor in Chem. Eng. After the war Mr. Fong expects to enter educational work in China. Project: Mechanism of catalysis in the carburization of steel. (4) B. W. Gamson, graduate student. Research project: The transfer of mass, energy and momentum in gas streams flowing through granular beds in catalytic processes. (5) R. B. Backmann, Instructor in Chem. Eng. Project: Kinetics of hydrogenation. (6) L. G. Massey, Senior Student. A.I.Ch.E. candidate for St. Pat. Contestant in beard-growing contest. President, Student Section, A.I.Ch.E. (7) J. G. Kané, Professor of Chem. Eng., University of Bombay, India. Now a graduate student at U. of W. Research project: The rate of oil extraction from cottonseed meal. (8) E. C. Carlson, Graduate Student. Rate of base exchange in zeolite water softeners. (9) O. P. Watts, Emeritus Professor of Chem. Eng. Author of numerous papers on electroplating and corrosion. Originated the "Watts hot nickel bath." (10) R. G. Taecker, Instructor in Chem. Eng. and L. G. Martin, Senior Student. Project: Pressure drops in plate and frame filter presses.

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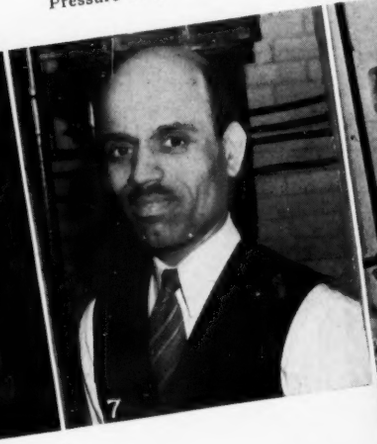
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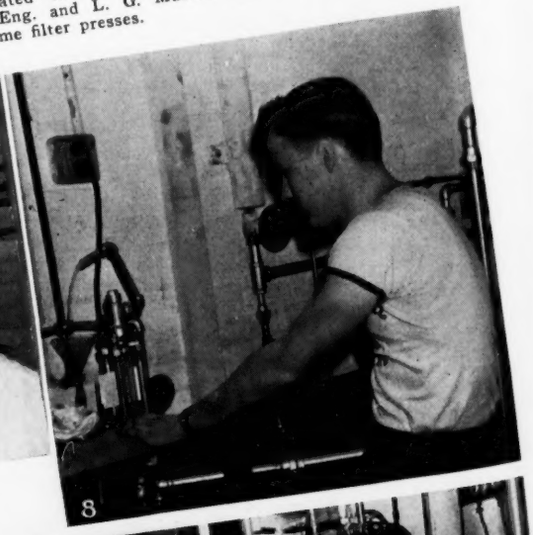
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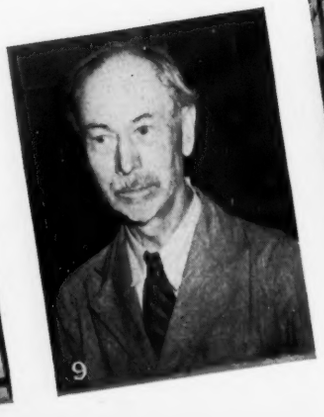
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Air Conditioning by

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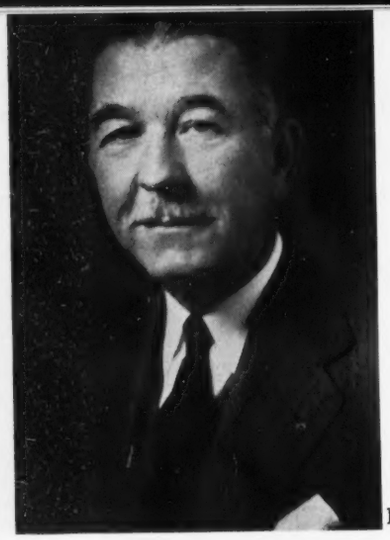
Headliners in the News



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Joint Army-Navy "E" was awarded to Monsanto Chemical last month at an informal ceremony at the executive offices of the company in St. Louis. In this picture, left to right, are Lee Warner, Monsanto plant policeman; Edgar M. Queeny, president; Gaston DuBois, vice-president and member of the Executive Committee; Commander F. E. Deam, naval materiel inspector in the St. Louis naval procurement district; R. R. Cole, vice-president and general manager of the Phosphate Division of Monsanto; Lieutenant-Colonel E. H. Sager, chief of the industrial division, St. Louis ordnance district; and Colonel Merle H. Davis, chief of the St. Louis ordnance district, who presented the award to Mr. Queeny.

3

(1) W. I. Galliher, director of sales, Columbia Chemical Division, Pittsburgh Plate Glass Co., has been put in charge of sales activities of the executive sales office of the division which has been moved to Pittsburgh from New York. (2) K. C. Frazier, for the last 10 years Southwestern manager of the Southern Alkali Corp., affiliate of Pittsburgh Plate Glass, has been appointed district sales manager of the New York metropolitan area for the Columbia Chemical Division of the company. (3) William E. Vogt has been elected secretary of Electro-Metallurgical Sales Corp., a unit of Union Carbide & Carbon Corp. (4) Rainsford F. Cotten, formerly assistant manager of the New York office of Victor Chemical Works, has been appointed manager. (5) John H. Karrh, formerly New York sales manager for Victor Chemical Works, has joined the sales division of Westvaco Chlorine Products Corp. (6) Victor E. Williams, assistant general manager of sales of the Organic Chemicals Division (New York) of Monsanto, has been promoted to the position of director of sales for the division. (7) Frederick C. Renner, assistant general manager of sales of the Organic Chemicals Division of Monsanto (St. Louis), has been promoted to general manager of sales.

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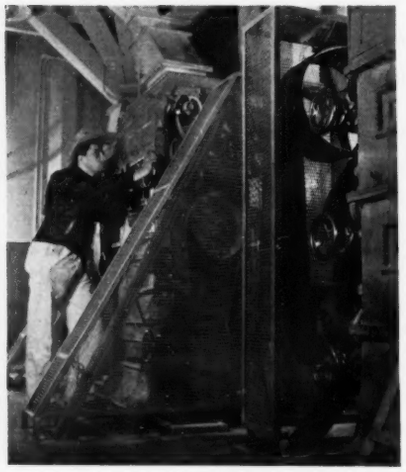
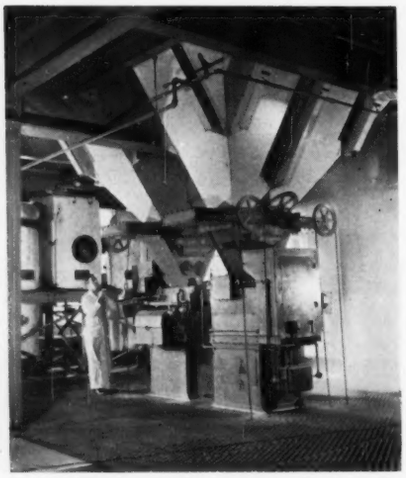
"Cyclone" of a former whiskey distillery now producing alcohol for war purposes whirls grain mash from which alcohol has been distilled to remove moisture. It is then ready for farm use as feed.

Production of Industrial Alcohol

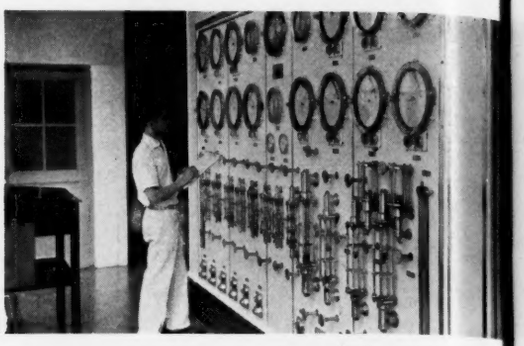


Grain from which industrial alcohol is made is broken on a triple-deck roller mill such as this one before cooking.



Grain meal is weighed on automatic scales and put into cooking vessels before being made into industrial alcohol.

The Office of War Information released some photos recently showing the progress made in converting whiskey distilleries to production of industrial alcohol. All of the photos on this page are official OWI photos (1) Control board makes it possible for one man to operate a complete 5-column distillation unit. Pure ethyl alcohol is distilled from a fermented mash of cereal grains. (2) This "dephlegmator" partially condenses distillates and passes on alcohol vapors to be condensed and drawn off. (3) Pressure vessels employ steam and cold water. Switchboard in background provides control of process by indicating which bins have grain and which grains are being cooked. (4) Yeast is allowed to grow to 130.75 gallons in these Donna cans and later to 3,000 gallons in a tub. (5) These 40,000 gallon tanks produce alcohol by action of yeast upon cooked grains whose starches have been changed to sugars by the enzyme action of malt. (6) Operator opening a valve to add yeast to mash in fermenting tank.



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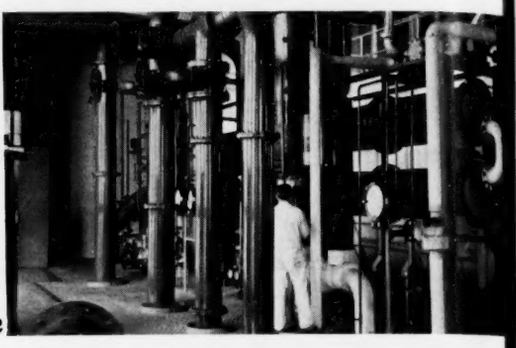

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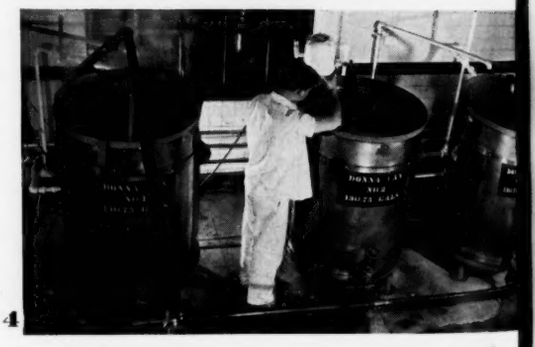

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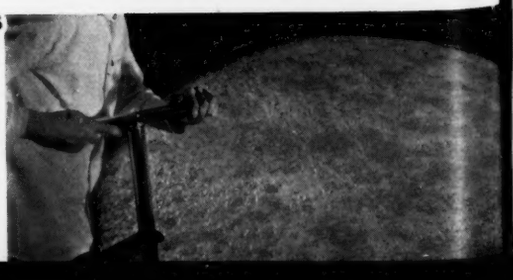

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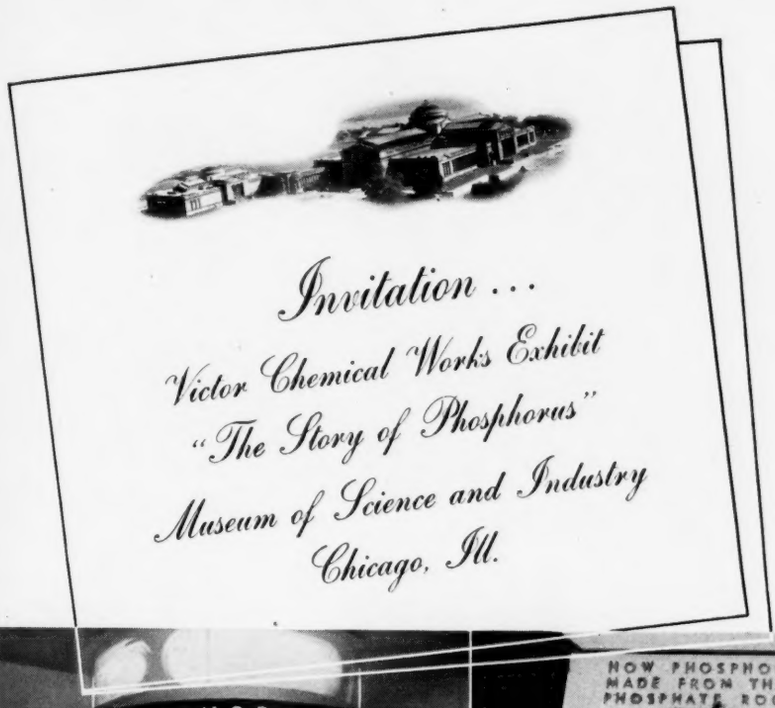
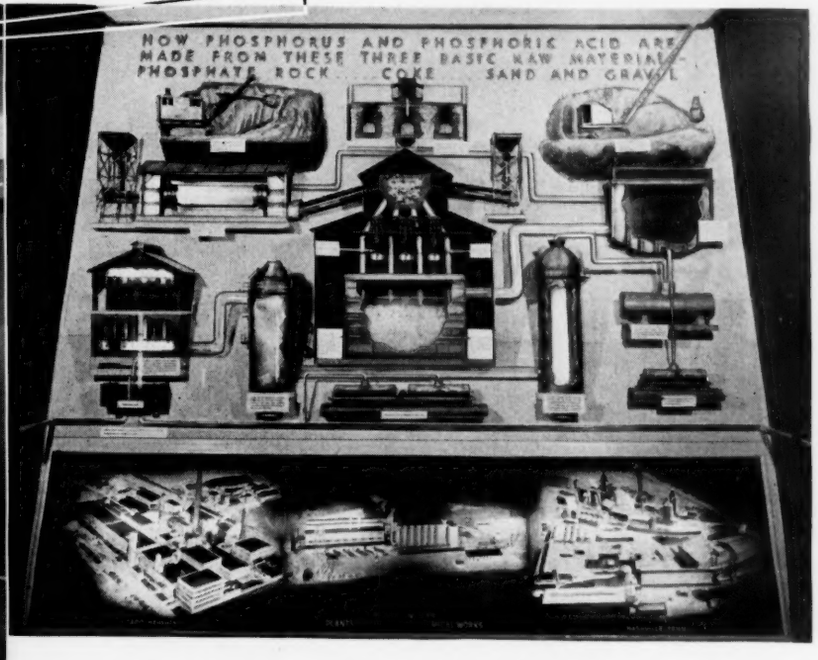


You are cordially invited to inspect the recently completed Victor Exhibit in Chicago's famous Museum of Science and Industry. It tells the story of phosphorus . . . and the important role played by phosphorus compounds in serving mankind . . . through a miniature pilot plant in actual operation, colorful translites, and ingenious working models that operate at the push of a button Two of the many displays of interest to layman and technical expert alike are illustrated below.



Above, left—Outstanding in the exhibit is this glass-enclosed pilot plant . . . a simplified version of the most modern and efficient phosphoric acid producing unit in existence. Here, for the first time, the manufacture of phosphoric acid can actually be seen . . . an operation heretofore concealed within the confines of brick and steel.

Above—In this animated production diorama . . . complete with miniature steam shovels in simulated action, model furnace, condenser, burner, hydrator, precipitator, storage tank, tank cars, etc. . . . is told the story of phosphorus from raw phosphate rock to ultimate conversion into a host of phosphatic compounds.

VICTOR *Chemicals*

In Commercial Production

Phosphoric Acid	Sodium Pyrophosphates
Pyrophosphoric Acid	Potassium Pyrophosphate
Polyphosphoric Acid	Alkyl Acid Pyrophosphates
Phosphorus	Formic Acid
Phosphorus Oxychloride	Aluminum Formate
Phosphorus Trichloride	Sodium Formate
Phosphoric Anhydride	Sodium Boroformate
Alkyl Acid Orthophosphates	Oxalic Acid
Ammonium Phosphates	Calcium Oxalate
Alkyl Ammonium Phosphates	Sodium Oxalate
Fireproofing Compounds	Magnesium Sulphate
Calcium Phosphates	Sodium Aluminum Sulphate
Magnesium Phosphates	Ferrophosphorus
Potassium Phosphates	
Sodium Phosphates	

VICTOR *Chemical Works*

141 W. JACKSON BLVD. CHICAGO, ILL.

HEADQUARTERS FOR

FORMATES • pH • OSPHATES • OXALATES

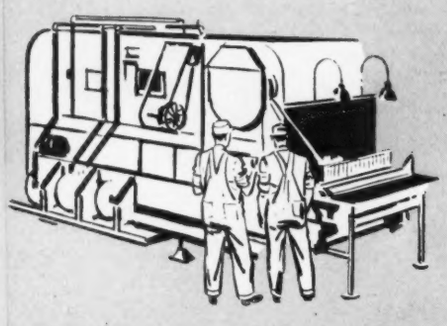
DIAMOND ALKALIES

Speed the war against DIRT

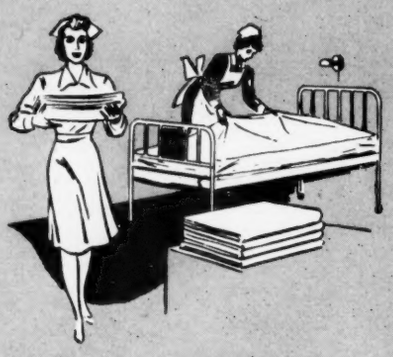
Throughout industry—in metal working shops, textile mills, food manufacturing plants; in hotels, hospitals restaurants—cleaning problems are met at every turn. And just like other problems, they must be dealt with efficiently, promptly, economically.

Through field studies and laboratory research, Diamond engineers have developed many specialized products that speed effective cleaning in a wide variety of applications. The illustrations on this page indicate a few of the ways in which Diamond Alkali products are successfully used in cleaning processes today.

DIAMOND ALKALI CO.
PITTSBURGH, PA., AND EVERYWHERE

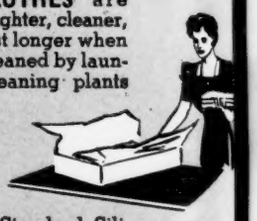


CLEANING FOOD PLANT EQUIPMENT is an important and constant job entrusted to Diamond Modified Sodas and Standard Silicates, specially developed for this service. In bakeries, hotels, restaurants, dairies, etc., these products keep machinery, floors, walls, tables clean and sanitary; dishes, silverware and metal equipment fresh and clean.



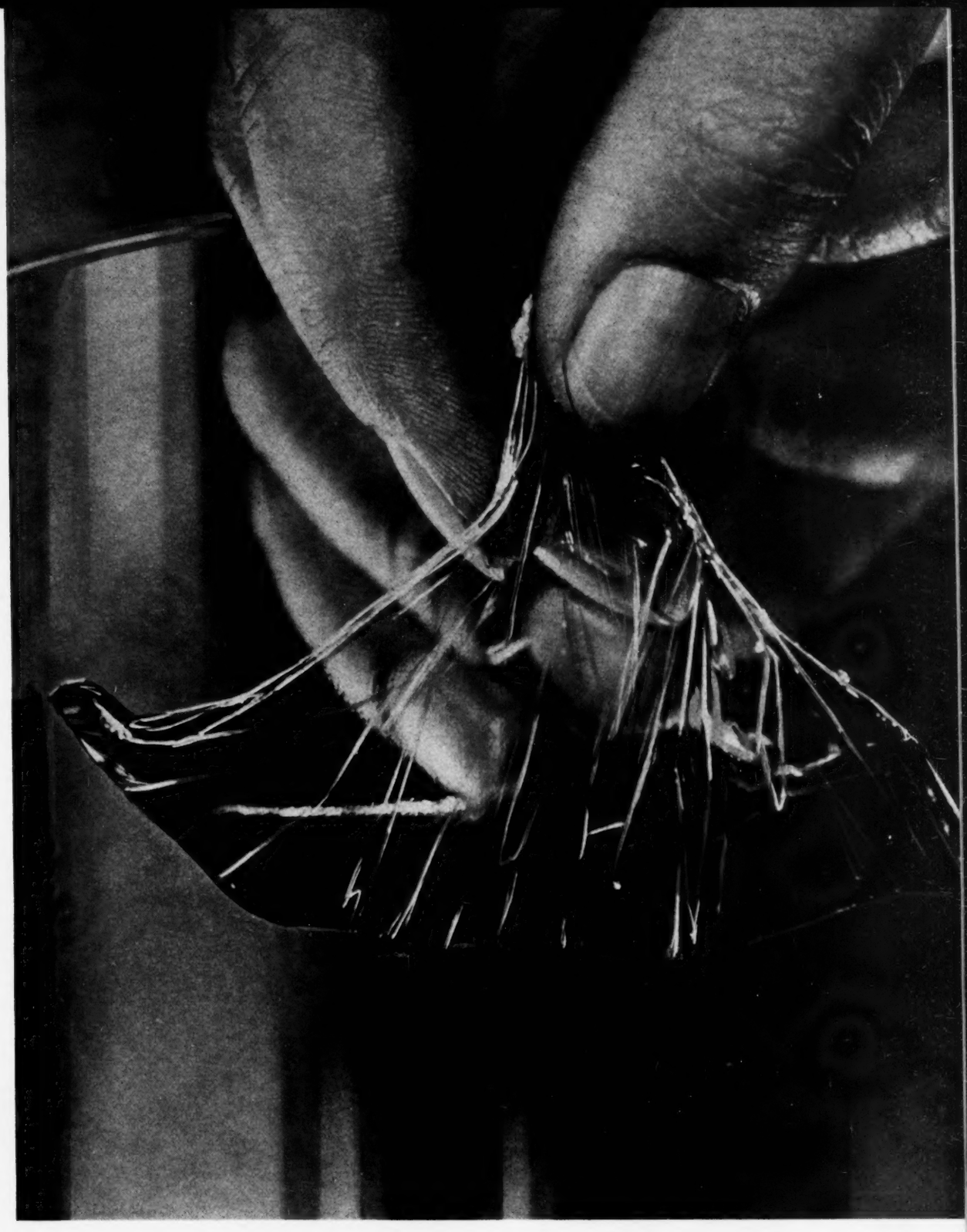
HOSPITALS make good use of the uniformity, dependability, and purity of Diamond Alkalies in cleaning walls, floors and equipment throughout the building, as well as in the kitchens, laundry, etc.

CLOTHES are brighter, cleaner, last longer when cleaned by laundries and dry cleaning plants that use Diamond products. In the highly specialized laundry fields, Diamond Sodas, Sours, Liquid Blue, and Standard Silicates are widely used, while progressive dry cleaners for many years have employed Diamond Carbon Tetrachloride and Diamond Dry Cleaner.



BOTTLING PLANTS frequently require very specialized alkalies to produce the clean, sparkling bottles demanded by sanitary and sales reasons. To meet the specific problems of individual plants, Diamond engineers apply "tailor-made" treatments of special Hi-Test Alkalies.

ALKALI
REGISTERED U.S. PAT. OFF.

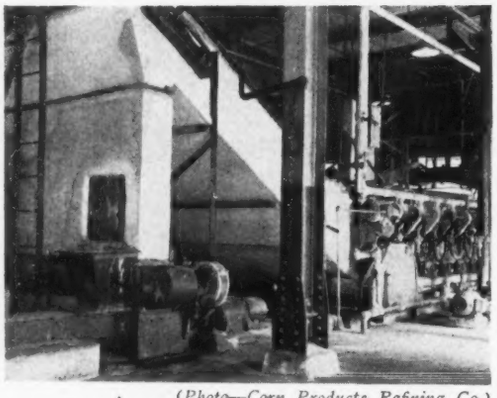


NEW CHEMICALS FOR INDUSTRY

This gigantic hand is holding a piece of U. S. Stoneware's "Tygon Tempro-Tec," one of the company's new non-adhesive formulations to provide easily-removed temporary protection to highly polished surfaces. New formulations are liquefied "Tygon" which form a stable non-adhesive film when dried.

Digest of Chemical Developments in Converting and Processing Fields

Present scarcity of steel has added emphasis to the use of wood in construction wherever possible. Improved protein adhesives made possible the use of wood in assembly of large construction units. *(Photo—Casein Co. of America)*



(Photo—Corn Products Refining Co.)
Extractor, manufacture of zein.

WITH a few notable exceptions, the protein patents issued within this period, can be classified in one of the following categories:

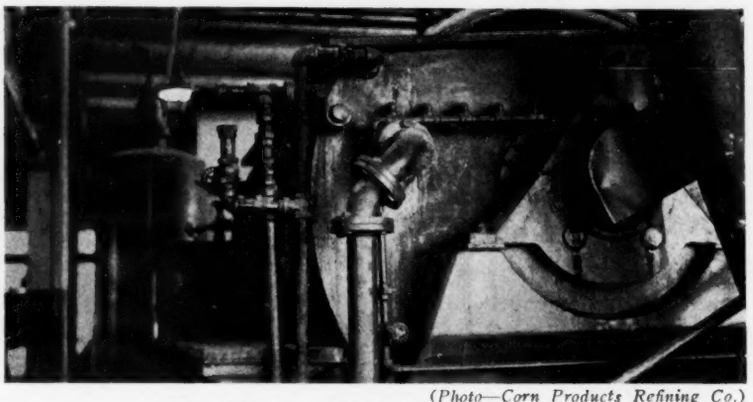
(1) Mechanical mixtures including protein as a non-reactive ingredient; the patentability being based largely on adaptation to a certain use.

(2) Application to proteins of chemical treatments, previously well known in other connections.

(3) Minor adjustments in conditions of processing, to improve basically old methods.

The first of these categories is too obvious in character to command much discussion, the specific patents being listed in the bibliography. Among the more striking and unconventional combinations may be mentioned a synthetic textile fiber made by extrusion of a mixture of cellulose xanthate and casein 154); a metal drawing compound comprising protein meal and lubricating oil 123); a plastic compound from a pine resin and corn protein, evidently used as an electric insulator 117); a foam stabilizer utilizing the emulsifier properties of proteins 114); sand blasting stencils 110), 115); mixtures with foam reducers 134) and various food combinations, or mixtures of proteins with plastics or other conventional compounds 130), 131), 138), 147), 150). The presence of casein in Portland cement prolongs the setting time 124).

Gluten screen, manufacture of corn proteins. *(Photo—Corn Products Rfg. Co.)*



(Photo—Corn Products Refining Co.)
Oliver Prescoat filter used in corn protein manufacture.

INDUSTRIAL PROTEIN CHEMISTRY 1941-1942

By Dr. Johan Bjorksten, Chemical Director
Quaker Chemical Products Corporation

Here is the story of the sharp increase in the commercial use of protein materials as reflected in the patent literature of 1941 and 1942. The author, also a patent attorney, points out that the relative abundance and great versatility of protein materials should encourage tremendous advancement in this industry.

Of previously known types of chemical treatments, tanning reactions are as usual the most conspicuous. I am now using the term "tanning" to signify all the reactions entailing formation of bridges between individual protein molecules, and consequent hardening of the product. Applied in the field of adhesives, various polyvalent metals of known tanning effect have been used to improve water resistance of glues 2), 7), or to impart more favorable mechanical properties to photogels 16), 17). The use of chrome for hardening spun casein fibers 163), although possibly entailing color problems, appears to present a distinct step forward, since this approach will lead away from the use of formaldehyde, an inherently undesirable embrittling agent, tempting for the users only because of the extreme rapidity of its reaction. Generally speaking, the protein textile industry, as expressed in patents issued to date, is still lagging considerably behind the older duplication and photographic industries in the intelligent utilization of tanning reactions.

Zirconium and uranium salts have been used as tanning agents; the former in hide tanning 17), the latter in connection with thixothropic gels from soya proteins 15). Possibly, the next mention of uranium in patent literature might be in a medicinal patent, relating to the fixation of radioactive substances. The effect of ultraviolet radiation in improving whipping properties of gelatin 12) may be due to a mild form of oxygen tanning; some years ago the author observed that exposure of protein gel to ultraviolet in an atmosphere of oxygen caused more rapid hardening than a similar exposure would cause in air.

Of an importance perhaps not yet fully assessed is the role of organic hydrogen donors in silicic acid tanning, 22), 23). The patents containing this disclosure are restricted to a specific field and may be capable of very much wider application. Also of appreciable potentialities beyond the field disclosed, is a way of circumventing after-hardening of protein gels, by the use of a tanner in an unstable combination, so that the tanner ceases to function after a certain period of time and progressive embrittlement is avoided.

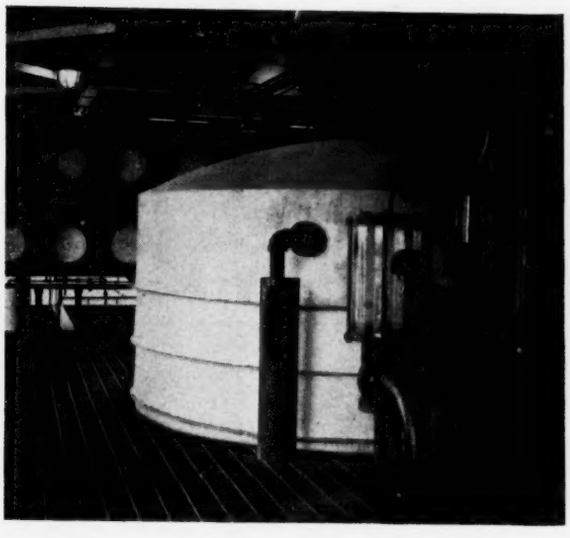
Methods borrowed from the field of water softening have been used in purifying proteins—these include treatments with ceolites 83) as well as with more recently developed ion-exchange resins 71).

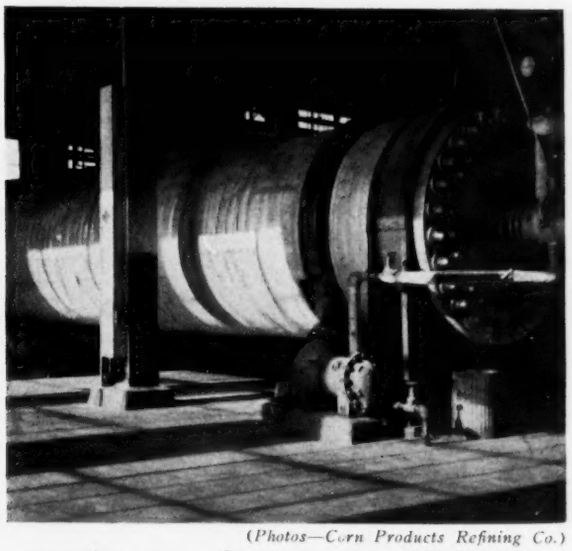
In the manufacture and purification of proteins, the old expedients of variations in pH, or in solvent combinations have been exploited in new modifications 70), 73), 74), 75), 76), 77), 79), 80), 81), 82), 85), 91). The manufacturing methods are still in a flux; optimum solvent, pH, thermal and other conditions are being laboriously approached, and manufacturing equipment and methods further developed 89), 90), 92½).

Controlled enzymatic degradation has again been resorted to in preparing proteins of desired viscosity characteristics, and also in removing certain objectionable protein fractions 26), 100).

In food and paint industries the wide utility of proteins as emulsifiers continues to be exploited.

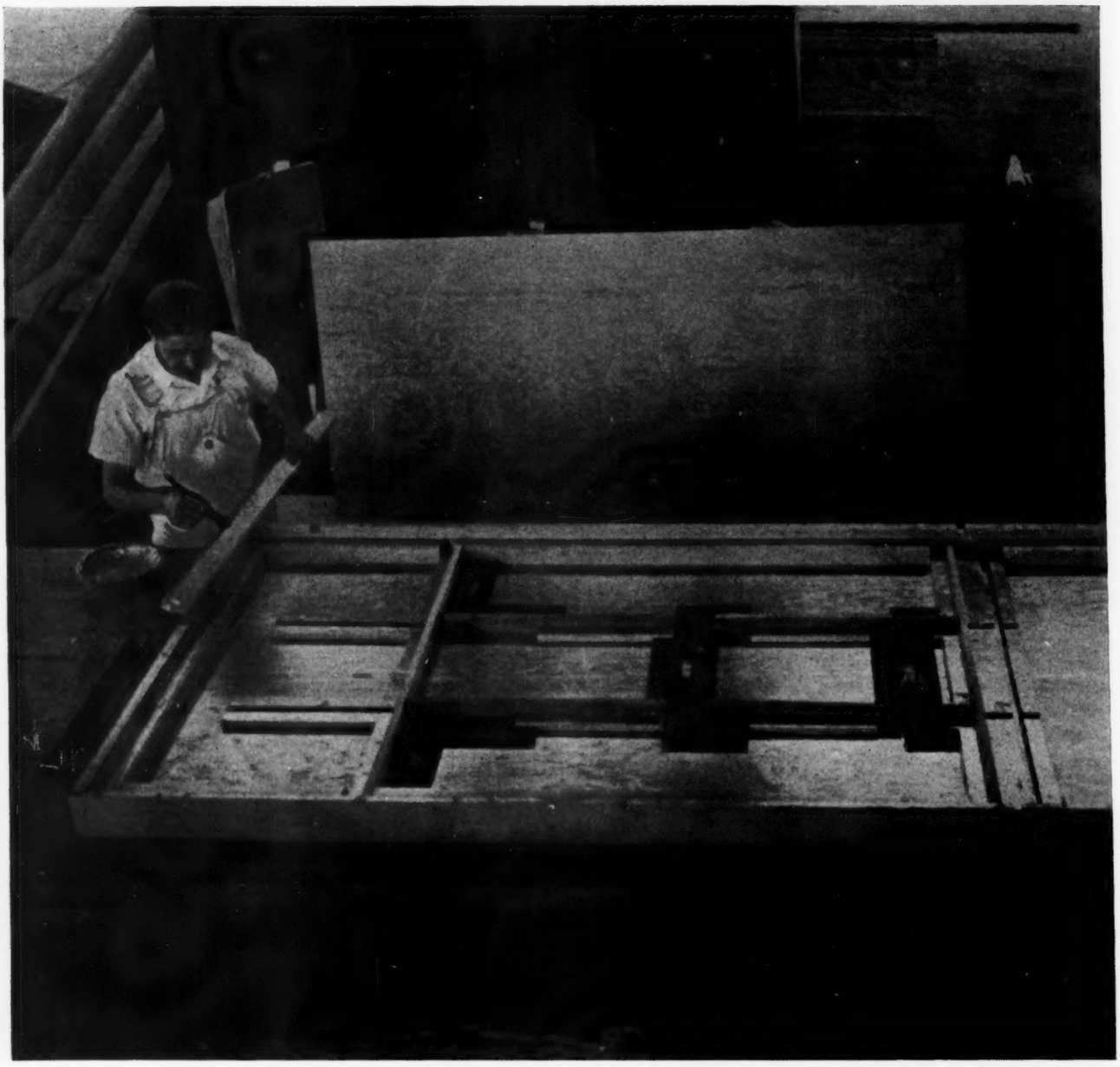
Greater originality is shown in reactions where a structure performing a specific function is being tied to a protein





(Photos—Corn Products Refining Co.)

Alcohol is a key extractant in prolamine manufacture. Above is alcohol still control instrumentation at a Corn Products Refining Co. plant. Above, right, is a gluten residue dryer.



A typical shop gluing operation using protein glues, in this particular case the assembly of plywood panel in jig. *(Photo—Casein Co. of America)*

carrier molecule. Here belongs the Katzman invention 129) of using the previously known metaphosphate-protein reaction to tie in higher alcohol groups with proteins, and the Russell and Stauffer idea of reacting a carboxylic acid chloride of a coupler, with gelatin itself, to form a stable non-diffusing combination 121).

Among observations of wider potential applicability may be mentioned the very appreciable toughening of zein films by steam, patented by Sturken 122). This effect may be closely related to the stabilization on heating of zein solutions observed by Evans and Manley 36). In both cases the effect is enhanced by the presence of aldehydes. It might appear possible that the effect entails an uncoiling of the molecule, as is generally the case in denaturation reactions, coupled with a subsequent aldehyde bridge formation between the uncoiled molecules.

The implications of a patent to Graves 69) are difficult as yet to assess. It shows that mixtures of polyamides of the nylon type with proteins may have higher mechanical strength than either component part alone. However, this patent manifestly has been drawn by men more familiar with polyamides than with proteins, and it is scarcely possible to judge from the disclosure whether genuinely new compounds are produced, or whether the effect involved is merely the strengthening of the protein component that could in many instances be normally expected in the presence of either a polycarboxylic derivative, or a polyamine, or also from even very slight traces of hexamethylene tetramine, that might be present.

The reference to proteins merely as a "gelatin," "glue," or a "casein" which still occurs in patents, may be justifiable in claims, but ought not to be permitted by the Patent Office in examples supposed to teach those skilled in the art how to apply the invention. The differences between products within any of these classes of protein are so great, that failure to specify the type of gelatin etc., permits a variation in result inconsistent with the requirement that the invention should be disclosed with sufficient clarity to enable

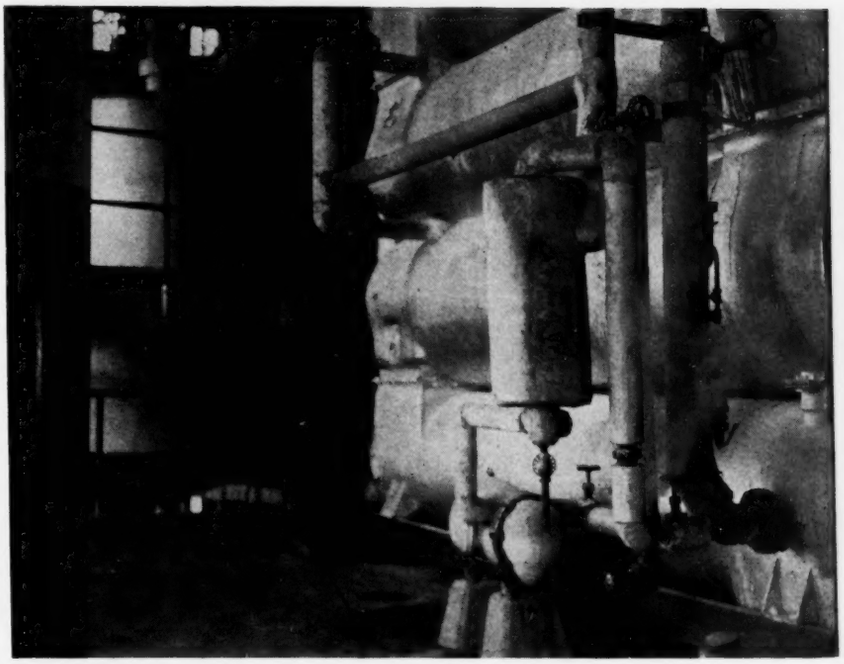
those skilled in the art to reproduce results.

In the medicinal field, the patents issued in the last twelve months do not appear to carry major fundamental implications. Publications by L. Pauling and co-workers 68) indicate possibilities of the manufacture of antibodies in vitro, and if this development materializes, patents of considerable significance may be anticipated.

The industrially very important problem of ageing of gluten in wheat flour has been the subject of at least two exhaustive investigations 56), 60), which indicate a connection between the deterioration of baking strength with age, and the presence of certain oleaginous fractions. If the author may hazard an opinion in a field which in recent years has been remote from him, he should like to point to the great similarity of the symptoms of deterioration of gluten on one hand, and the tanning of proteins with traces of lower aldehydes on the other. It is well known that oils of high iodine number may spontaneously oxidize so that the carbon chains are ruptured and lower aldehydes split off. This is familiar to anyone who has had the dubious pleasure of exposure to air in a room newly painted with linseed or soybean oil paint. The stinging odor is greatly reduced by ammonia, indicating its aldehydic nature. The amounts of aldehyde similarly liberated by the oxidation of readily oxidizable unsaturated fatty acids present in flour, may fully account for the gradual loss of elastic properties and solubility of the gluten, shown in these publications.

An observation of possible industrial implications is that protein gels which are rhythmically stretched and relaxed while under the influence of hardening agents, may have a tensile strength 200 to 300 per cent higher than gels of identical composition similarly hardened, which have not been rhythmically stretched 65). This increase in tensile strength takes place in all directions of the gel, and is contingent on the presence of a tanning or hardening agent. Such rhythmical stretching and relaxing could be readily effected in continuous production by the passage over rollers or reels revolving at alternatingly higher and lower peripheral speeds. If this effect can be brought to completion in short time intervals, its application will materially enhance the utility of protein textile fibers, sheets, plastics, etc. The industrial implications of this effect are broadly covered in patent applications pending or in preparation.

The relative abundance and great versatility of protein materials has led to a sharp increase in their commercial uses, which should become increasingly apparent in the patent literature of 1943 and '44.



Apparatus for steam treatment of crude protein meal. *(Photo—Corn Products Rfg. Co.)*

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The characterizing sentence given for each patent may enable the reader to form a preliminary estimate of its interest to him; it is not intended to be an exhaustive abstract.

ADHESIVES

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(2) J. R. Hubbard, U.S. 2,246,405; water resistant glue, Al or Cr, volat. org. acid pH to be raised by evaporation of org. acid after application.

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(4) C. Schulein, U.S. 2,259,664; cold sealer—cellulose derivative, volat. solvent, casein, H. CHO, filler.

(5) W. M. Glenn, U.S. 2,263,576; sizing bonded via intermediate layer.

(6) E. F. Christopher & F. L. DeBeukelaer; glue plus urea, biuret or $Ca(NO_3)_2$ in quantity to impart re-moistening quality and fast setting, but less than 10%.

(7) L. Bradshaw, U.S. 2,266,736; casein, alkaline solubilizer and zinc salt.

(8) J. G. Mark, U.S. 2,279,256; rubber—resin—casein emulsion.

(9) J. W. Close, U.S. 2,284,800; dispersion of corn protein and alkali resinate, plus bleach at certain temperatures.

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(14) Sturken, U.S. 2,250,040; non-gelling zein solution—solvents.

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(39) N. C. Fischer, U.S. 2,237,827; egg white, agitate, dry while insolubles are dispersed.

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(46) A. Bergmann, U.S. 2,257,222; artificial sausage skins of protein material.

(47) A. Musher, U.S. 2,278,476; structure disrupted steam exploded animal protein.

(48) A. Musher, U.S. 2,279,202; cheese composition.

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(81) H. Iwamae, U. S. 2,272,562; soybean protein extraction acidities precipitating at isoelectric point.

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(88) E. F. Christopher, U. S. 2,290,538; gelatin manufacture, extractant is dilute alkali containing soap.

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(92) L. C. Swallen, U. S. 2,287,649; Zein extraction, like (80).

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(103) J. B. Speakman, U. S. 2,261,094, waving hair by disrupting cystine bond in keratin with formation of sulfhydryl groups and treating with polyvalent metal compounds.

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(107) Dr. Kremers, Ger. 696,602; lactalbumin from whey—ammonia, centrifugation, A. C. current, spray drying.

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(109) H. B. Morris, U. S. 2,248,480; thickening latex with casein and zinc.

(110) J. Wartha, U. S. 2,251,646-2,251,647; sandblast stencil—rubber type compounds containing glue.

(111) J. R. Fitzgerald, U. S. 2,254,033; method of making photographic screen stencils.

(112) C. L. Nottebohm, U. S. 2,256,034; artificial leather from carded fiber fleeces, may use gelatin or casein as binders.

(113) E. Glaser, U. S. 2,258,755; process for making photo gelatin coatings.

(114) G. G. Urquhart, U. S. 2,269,958; foam stabilizer from soybean protein.

(115) C. E. Frick, U. S. 2,270,945; sandblast stencil containing glue.

(116) C. W. Rice, U. S. 2,271,499; water treating comp. with acidified protein and zinc or aluminum.

(117) J. H. Hunter, U. S. 2,276,304; corn protein and oxidized abietic acid.

(118) H. A. Seran, U. S. 2,279,532; cleaner containing some glue.

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(122) O. C. H. Sturken, U. S. 2,285,758; curing zein with steam.

(123) J. E. Montgomery, U. S. 2,286,433; drawing comp.—proteinous meal plus petroleum oil.

(124) E. G. Gruenwald, U. S. 2,290,956; .2 to .4% of casein retards setting of Portland cement.

(125) Gelaprint Soc. Anon., Brit. 519,164; mechanical shaped articles from gelatin and latex.

(126) A. B. Purnol, Brit. 520,140 (1940); starch plus protein acidified with boric acid.

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(130) J. F. Corneau, U. S. 2,246,620; water paint, mostly cement plus glue.

(131) Barrell, U. S. 2,250,346; resin base water paint with some glue.

(132) H. A. Scholz and E. B. Oberg, U. S. 2,257,280; thixotropic stable paint with vegetable protein, alkaline solvent and a metal tanner, heated 15 minutes.

(133) Scholz, U. S. 2,257,281; water paint comprising proteid binder.

(134) J. F. Corwin and R. C. White, U. S. 2,271,389; foaming of casein reduced with tributyl citrate.

(135) A. J. Heberer, U. S. 2,274,695; protein dispersion water resistant when dry, with vegetable protein, drying oil, formaldehyde.

(136) M. Leatherman, U. S. 2,277,048; thixotropic dispersion of metal resinate, calcium proteinate, trace of lime.

(137) E. B. Schuler, U. S. 2,280,546; casein solubilized in sodium ortho phenyl phenate. (Dowicide A)

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(140) Myers, U. S. 2,243,644; protein plastic with specified aromatic acids.

(141) O. Neuss, U.S. 2,256,253; urea formaldehyde protein.

(142) J. A. Parsons, U. S. 2,257,067; casein plastic extrusion—mechanical mottled effects.

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(144) G. H. Brother et al., U. S. 2,262,422; thermosetting, soyabean, formaldehyde, plus bakelite type resin mixed.

(145) H. M. Weber, U. S. 2,264,732; alcohol soluble protein, phenol, aldehyde.

(146) C. Luckhaupt, U. S. 2,269,464; casein, ammonium acetate molding mix.

(147) M. J. Batelja, U. S. 2,269,509; plastic mix from oats, very specific.

(148) P. L. Julian, U. S. 2,281,584; non-water soluble soybean material reacted with aldehyde and combined with either urea formaldehyde or bakelite resin.

(149) L. E. Dimond and W. Llewellyn Hicks, U. S. 2,285,193; water soluble slightly acidic degraded protein reacted with phenol and aldehyde.

(150) J. P. Dickson, Brit. 523,759; aqueous protein mixed with polyhydric alcohol, borate, molded with hardening agent.

(151) A. Aasen, Brit. 524.421; fish meat plus aldehyde kneaded to give thermoplastic.

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(154) J. H. Hegan, U. S. 2,250,375; cellulose xanthate and casein solution extruded together.

(155) E. B. Higgins, U. S. 2,250,377; waterproofing of textiles. Impregnation with an albumen or globulin, coagulating with heat, and treating with hot fatty soap solution.

(156) Cooperative Condensfabriek "Friesland," Dutch 50,417; protein spinning—acidity conditions, urea raises solubility.

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(158) D. Traill et al., Brit. 524,090 (1940); peanut protein aged in ammonia until viscosity increased 5 fold.

(159) H. Dosne, Brit. 525,371; dyeing ingredient incorporated in spinning solution.

(160) Coop. Con. "Friesland," Brit. 525,157 (1940); pH limitations, salt present in protein spinning solutions.

(161) N. V. Onderzoekingsinstituut Research, Brit. 525,738; stretched by series of rollers of increasing speed in contact with hot salt solutions, then hardened with formaldehyde.

(162) H. Iwamae, Brit. 535,012; coagulated protein fibers passed through buffer solution of iso-electric point of protein.

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(164) N. V. Onderzoekingsinstituut Research, T. Kock, Ger. 692,232 (1940); casein spinning.

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(166) T. Kock, Fr. 835,313; casein spinning.

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NEW PRODUCTS AND PROCESSES

By James M. Crowe

NEW formulations of ethyl cellulose plastic designed to replace rubber have been found suitable for many uses of the now scarce material, according to the Hercules Powder Company.

Soft formulations of this plastic can be used instead of rubber in gun covers, electrical tape or "friction tape," water tubing to replace brass, raincoats, hospital sheeting, garden hose, and other kinds of rubber hose, mason jar rings, surgical tape, wire insulation, golf balls, baby pants, gloves, impregnated fabrics, coated fabrics, washers, and footwear. It is also described as resistant to mustard gas.

Ethyl cellulose when compounded with oil and chemical plasticizers in the range of 40 to 60% ethyl cellulose and 60 to 40% plasticizer, produces compositions having many of the qualities which have made rubber applicable to numerous products.

The new plastic formulations, the company said, while not suitable for tires or inner tubes as presently developed, would probably be suitable for rubber applications which before the war consumed 60,000 tons of rubber.

All of the materials required for the manufacture of ethyl cellulose are domestic materials or materials obtainable in sufficient quantities for large-scale production. Raw materials required for the manufacture of ethyl cellulose itself are cotton linters or wood pulp, caustic soda, chlorine and alcohol from natural gas, or from fermentation of agricultural products.

Qualities of the various formulations are toughness, pliability, flexibility, impermeability, and thermoplasticity. The soft type mixtures can be made to retain good flexibility at temperatures as low as minus 70°F., a temperature at which most plastics will shatter like glass upon impact.

Properties which restrict the application of ethyl cellulose are its limited elasticity and lesser resistance to tearing than rubber.

Laboratory tests made thus far upon the material have developed some of its properties which are now available to molders and fabricators. A wide range of properties may be produced by varying the formulations, particularly the plasticizers used. The most likely plasticizers for formulations are animal, vegetable, and some mineral oils as well as the usual chemical plasticizers. Among those tested are raw castor oil, cottonseed oil, Aroclor 1260, Hercolyn D, tricresyl phosphate, Fractol A, Opalwax, Paraplex RG8, corn oil, soy bean oil.

Some formulations have quite good abrasion resistance and tensile strength sufficient for many uses. Water resistance comparable to that of compounded rubbers can be built into these soft-type cellulose plastics.

Resilience ranges one-fourth to one-half that of rubber samples tested. While tensile strength of some of the sample formulations is superior to that of rubber, elongation or stretch of these samples is considerably less than that of rubber. Samples may be flameproofed by the use of tricresyl phosphate, chlorinated diphenyl and chlorinated paraffin.

Two types of ethyl cellulose, N and G, are used in the formulations, the N having 48% ethoxyl content, the G, 45%. The lower ethoxyl content has been found better for injection molded plastics, the higher content better for extrusion molded plastics.

The G type ethyl cellulose plasticized with some plasticizers shows little effect from exposure to gasoline. In general, both the N and G types are unaffected by motor oil. Some formulations show a slight increase in stiffness although not as much as rubber. Strong soap compositions (sodium carbonate) do not harm the plastic. Some formulas are unaffected by butter, indicating it may possibly be used for containers for food products. It is quite resistant to ozone, a property of interest to the electrical industry.

New Silicate Grades

Two new grades of Potassium Silicate have been announced by the Philadelphia Quartz Company. Called Kasil #2 and Kasil #6, they are specially concentrated solutions, developed primarily for the manufacture of welding rods. One of the most important processes in the welding rod industry is the extrusion method of production which employs potassium silicate of correctly controlled viscosity.

Kasil #2 is a 32° Baume product with the molecular ratio of 1:3.92 and Kasil #6 is 40.5° Baume, molecular ratio 1:3.29. Both grades are offered at present in steel returnable drums as well as in single trip packages.

Other uses for the Kasil Potassium Silicate include carbon electrodes, paints and applications where non-blooming films are desired.

Colloid for Dehydrated Foods

Due to the fact that dehydrated foods have suddenly become an important item in the food industry, it would seem timely to warn the manufacturers rushing into this business that there are difficulties not only in manufacturing the product, but in reconstituting it after it has been dried. This is particularly true where juices and purees are run to dryness. In such a case, it has been found wise to coat the particles with a colloid which will give a suspending medium to the particles when water is added.

A new domestic gum has been developed for this purpose, known as "Veg-A-Loid" by the Coleer Co. It is an extract of domestic vegetables entirely suitable for food purposes, which has a tendency to coat the dried particles and to sustain them when water is added. It gives "body" to fruit juices and has been particularly advantageous in the drying of tomato juice.

Soap Antioxidant

War needs have taken away an ingredient normally used in toilet soaps to prevent rancidity and discoloration, but chemistry has provided a replacement. The new ingredient, known as an antioxidant, is called SA 326 and was developed by the Monsanto Chemical Company.

An antioxidant is used in high grade toilet and bath soaps to guard against sunlight and long standing, which if no protection is provided will cause the soaps to become yellow and rancid. The antioxidant heretofore used for this purpose has been an organic compound derived from toluene. Now, however, all available toluene is needed for making TNT (trinitrotoluene) and other direct war materials.

SA 326 is described by Monsanto chemists as an organic amine. It is made from raw materials which are currently available and which are not likely to be required in the war effort.

High Octane Synthetic

A new high octane blending synthetic which increases the power of high octane aviation gasolines, has been put into commercial production by Shell Oil Company, Incorporated.

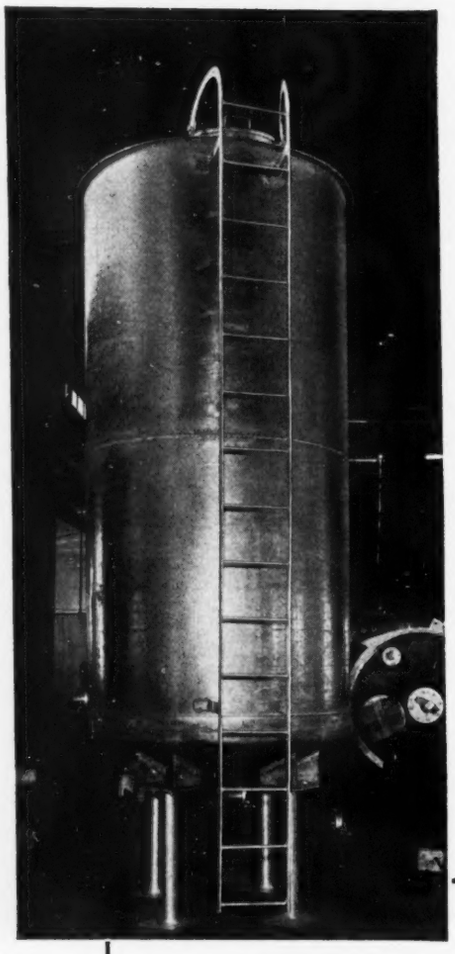
It is possible to convert certain types of existing plants over to the production of this essential product in a short time. Conversion of some refinery facilities to the production of this product was accomplished in record time.

This was made possible by the promptness of the War Production Board and the Office of the Petroleum Coordinator in granting priorities covering the allocation of necessary materials.

For some time Shell research engineers have been investigating potential ingredients to improve the quality of high octane gasolines, and this chemical was found to have unusual qualities. Additional research was then necessary to establish the operating conditions required for the synthesis of this chemical. The new product was found to have an exceptional anti-knock quality in the supercharged aviation engines, making possible quicker take-offs and heavier loads.

Designed for a War Industry

BY PATTERSON-KELLEY



66" in diameter and 152" high, this Patterson-Kelley Vertical Storage Tank is constructed of 1/2" aluminum plate. It contains 66' of 1 1/2" aluminum I.P.S. tubing. Fill chute measures 14" x 20". The ladder is of steel.

This aluminum stearic acid remelt tank is a product of Patterson-Kelley's years of practical experience in engineering durable, efficient industrial equipment. From blue print to installation of the completed tank, Patterson-Kelley engineers and designers, mechanics and inspectors make it their business to see that the finished product meets performance specifications to the letter.

That's the kind of teamwork that has become familiar practice in Patterson-Kelley's East Stroudsburg plant. Through the years, it has resulted in re-orders of Patterson-Kelley autoclaves, kettles, cookers, separators, stills, tanks and heat exchange equipment from many of America's largest industries. These units may be fabricated in a variety of metals and alloys to meet the most exacting requirements of your operating conditions.

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PLANT OPERATION AND MANAGEMENT

Thousands of steel drums and barrels which would be junked in normal times are being reclaimed by Chicago plant of Sherwin-Williams. Here is final step in the reconditioning plan—a coating of protective enamel. Is your plant doing this to help out?

Digest of New Methods and Equipment for Chemical Makers

N. Y. City Volunteer Auxiliary Firemen put on a demonstration of the manner in which they would handle damage caused by incendiary bombing attack. *(OEM photo)*

FIRE — Foe of War Production

By James M. Landis, Director

U. S. Office of Civilian Defense

Every week must be a "Fire Prevention Week" in the chemical industry. Here are points on fire prevention for industry right from the top of our OCD. The chemical industry is especially important to our war effort. It must keep adequate defense against fire.

IN his Fire Prevention Week proclamation, President Roosevelt declares "It is essential that destructive fire be brought under stricter control in order that victory may be achieved at the earliest date."

This message should be taken to heart by American industry. America's factories suffer from 35,000 fires annually, causing losses that exceed a hundred million dollars. As plants increasingly go on three shifts and as more and more untrained workers pour into industry, the

James M. Landis, Director, U. S. O. C. D. *(OEM photo)*

Message center of civilian defense communications showing operator receiving teletype information from distant points and passing it on for action. *(OEM photo)*

Every member of plant fire fighting organization should be taught how to put out fires in flammable liquids. Here is proper method of using foam extinguisher on oil.

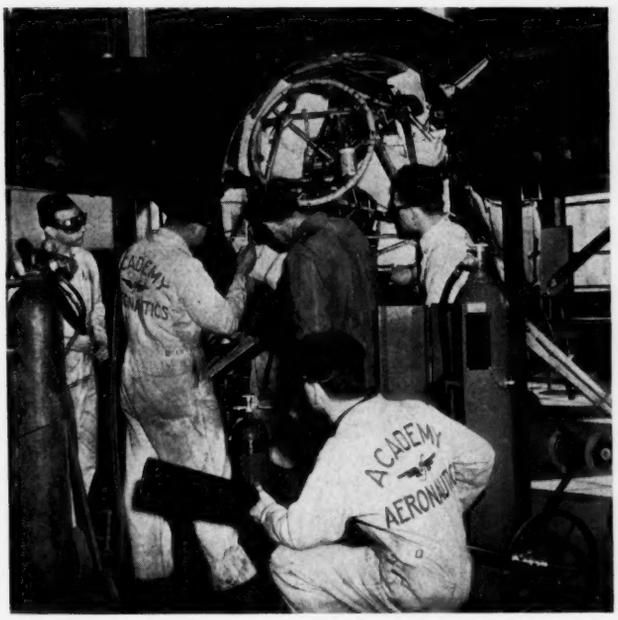
fire menace will loom even larger. Incendiary bombs and saboteur arsonists are very real added dangers.

Of special importance to our war effort is the chemical industry. Not a plane can fly, a tank roll, a ship sail, nor an army advance without the use of many products of this industry. It is, therefore, essential that the chemical industry maintain at all times adequate defenses against fire caused either by accident or by hostile intent.

Then, too, it must be realized that very often chemical manufacturing operations are conducted under extremely difficult conditions. Many operations involve the use of flammable materials. Further it is more difficult to control these materials while actually going through the manufacturing processes than when such materials are in storage. Often in manufacturing operations flammable materials must be transported in one way or another over relatively large distances either manually or by extensive and highly complicated systems.

Since the Office of Civilian Defense has been entrusted with the development of a passive protection program for all plants not specifically owned by the government or currently engaged in important war and navy contracts, the OCD has been, since its earliest days, greatly concerned with this problem.

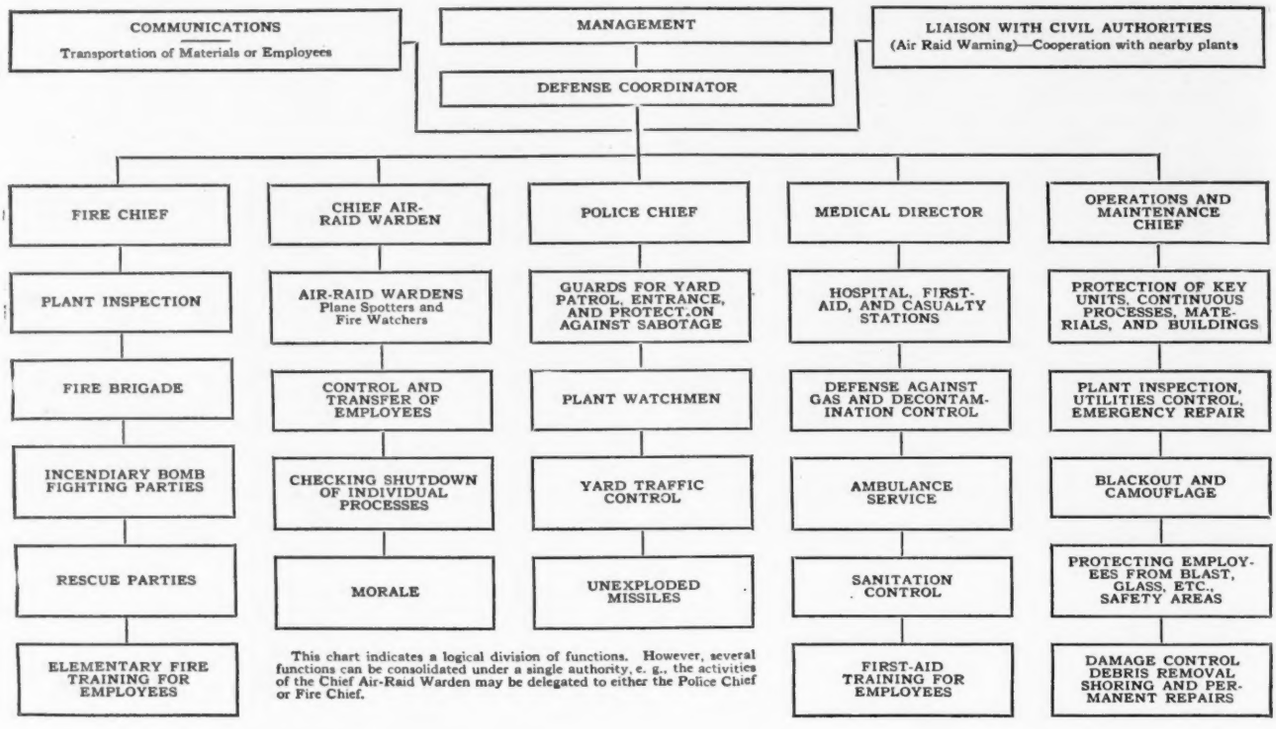
Management has the primary responsibility for proper passive plant protection. This responsibility is directly related to the problem of maximum production and safety. It is urged that



Aircraft workers in training are taught safety precautions. Here one student stands at alert with shielded nozzle of carbon dioxide extinguisher. *(Walter Kidde & Co. photo)*

Water should not be used on electrical fires because it conducts current. Here a worker is using a two-gallon vaporizing liquid type extinguisher on transformers.

SUGGESTED INDUSTRIAL ORGANIZATION CHART FOR AIR-RAID PRECAUTIONS



This chart indicates a logical division of functions. However, several functions can be consolidated under a single authority, e. g., the activities of the Chief Air-Raid Warden may be delegated to either the Police Chief or Fire Chief.

joint committees of employers and employees be established to facilitate the organization, training and operation of the various services in industrial plants.

Passive plant protection requires organization. There are two main parts: (1) the management of personnel and discipline, and (2) physical installations and equipment. Five main services compose the first: Fire Services, Air Raid Warden Services, Police Services, Medical Services and Operations and Maintenance Services. The physical installations include measures for blackout, protective construction and in a few instances relating to vital war production plants, protective concealment.

In August 1941, the Office of Civilian Defense issued "Protection of Industrial Plants and Public Buildings." A revision based upon new developments, will soon be released entitled "Passive Protection for Industrial Plants." Passive plant protection consists in protecting production, personnel, property, material and products from the effects of air raids. Fire is one of the greatest potential dangers inherent in an air attack. Internal protection and security, on the other hand, includes those measures designed to prevent interruption or delay in production caused by fire, accidents, espionage and sabotage.

Generally, the organization of plant defense closely resembles the community's pattern on civilian defense. The Plant Coordinator corresponds to the Commander of the Citizens' Defense Corps. Empowered to initiate, direct and control the complete organization, the Defense Coordinator may be assisted by Deputy Coordinators who are Second and Third in Command, so that someone will be on duty or readily available 24 hours a day. Their duties correspond to those of the Executive Officer and Comptroller of the Citizens' Defense Corps.

If necessary, he may also appoint Division Coordinators and a Training Chief who will be responsible for training personnel in conjunction with the local Civilian Defense authorities. In this connection, the plant should be considered as having prior need for the services of its employees over that of the local Civilian Defense organization. Workers essential for key operations should *not* be selected for air raid services if others are available. Those selected should have no commitments that would prevent their being at the plant during an emergency. Every employee assigned to duty should qualify to wear the official insignia of the OCD for the service or unit to which he is assigned.

A plant protection system that will function effectively 24 hours a day, should be established regardless of shift, part-time operations or shut-down periods. During an actual air raid the Defense Coordinator by personal check, should make certain that the various precautionary measures (such as blackout) are in effect.

For passive plant protection to function there must be a positive, efficient, and dependable communications system connecting with outside sources and within the plant. Though telephone is the basic medium of communication, such auxiliary methods as use of cyclists, foot messengers, radio, police and fire call boxes should be readily available for communication both within the plant and with the local authorities. Arrangements should be made with local Civilian Defense officials to receive air raid warnings *at all times* either directly from the local Control Center or by means of a chain-calling system of communications. A central point, continuously manned, must be established where such air warnings will be received. In larger plants, an unlisted line, used merely for this purpose, is desirable.

The entire system is controlled from a central headquarters called the Plant Control Room. Here all reports of the plant's damage are received; and from here the various units are dispatched. The Plant Control Room should be situated to provide the greatest safety to both staff and equipment. Among other things, control charts and maps of the premises should be readily available. Complete information of the progress of any incident should be maintained at all times.

When the preliminary air raid warning alert is received, the Defense Coordinator reports to his control room and directs the organization from this strategic point. Immediately this warning is transmitted to employees assigned preparatory defense duties who assume their stations and take such precautions as have been previously designated, without

Auxiliary police number among their most important duties the guarding of various points where saboteurs might hope to operate. *(OEM photo)*

interrupting the work of other employees. Only when the Red Signal is received should the general alarm be given unless other instructions have been received that production should not be interrupted until actual attack is imminent.

To decentralize control, larger plants might be divided into Divisions (each in command of a Division Coordinator with a Division Control Room). The basic sub-division of all plants is the Post. A Post area may either correspond to the various departments or be established as required on the different floors. Every Post is directed by a Post Warden, who is often a foreman. Moreover, each Post is a central point from which reports of damage in the Post area are dispatched to either the Division Control Room or to the Plant Control Room. In short, every Post should be as self-sufficient as possible, functioning if the main Plant Control Room cannot be reached.

In many cases, the plant safety director will be selected as the Defense Coordinator. He should have sufficient time from his regular work to devote to his defense duties. After consulting with his local Defense Council, and others, he should adopt a suitable program for his plant.

Many executives have been attending Plant Protection Schools. Thousands of employers representing millions of employees have been taking these classes. Very frequently they are sponsored by the State Defense Councils under the auspices of the Regional Offices of Civilian Defense. Many States have held and are holding such classes, advising executives of their responsibilities, duties, method of combating incendiaries, etc. Furthermore, large manufacturing associations have been giving "refresher" courses for such executives.

In most industrial plants specific responsibility for fire prevention and extinguishment has been aptly vested in a Plant Fire Chief. In the organization for air-raid protection, his functions are of primary importance. He must be given the complete support of plant ownership and management as well as have the authority to compel (if necessary) the attention of production and maintenance superintendents, foremen, and others to the requirements for fire safety. In cooperation with the Defense Coordinator, he should appoint and instruct competent deputies and arrange for one to be on duty at the plant at all times when it is in operation. Jointly with the Chief Air Raid Warden, he should select fire watchers. Among other duties, he should:

1. See that automatic alarm equipment is properly maintained and regularly tested.
2. Inspect daily all fire appliances and sprinkler control valves.
3. Organize and regularly drill a plant fire brigade in the use of private fire protection equipment.

Thus far we have discussed civilian defense in terms of individual plant protection. But there are other phases which also concern the chemical industry. One is the provision of non-critical materials for use in the manufacture of civilian protective equipment. Fifty-two million Americans live in "target areas." Already 404 localities with a total population of 41,892,738 have been designated as priority cities to receive protective equipment, while 129 other localities have been assigned priorities other than first.

The OCD procurement program, which includes gas masks, fire-fighting equipment, helmets, etc., is well under way, but, because of WPB rulings, difficulty has been experienced in securing gasproof and decontamination clothing, rubber boots, electric lanterns, and hose accessories. With the aid of the chemical industry, however, enormous strides have been made towards obtaining suitable substitute materials.

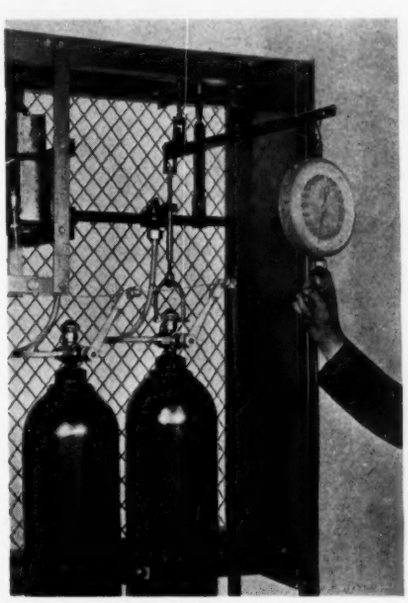
Chemists and chemical engineers are assisting the OCD in still another way. Recently the Office of Civilian Defense, jointly with the Commission on Higher Education and Civilian Defense, launched a program whereby many universities would contribute the services of some of the most valuable faculty members to Regional, State and local Civilian Defense offices. Among the types of "Volunteer Consultant" now being utilized from the universities are:

1. *Chemists and Chemical Engineers* who can advise on problems related to protection from war gases to serve as State Gas Consultants and as Senior Gas Officers in local communities, in the detection of gas and food, water and air, and to delimit areas to be decontaminated after an attack;
2. *Sanitary Engineers* to assist chemists in the detection of gases, to advise in the decontamination of contaminated areas and of food and water supplies and to advise of precautionary measures in the field of sanitary engineering;
3. *Medical Officers* trained in the medical phases of chemical warfare and instructors for groups of physicians who wish to prepare for the handling of casualties;
4. *Physicists, Chemists, Engineers and Medical Faculties* interested in the effects of different kinds of bombs upon buildings and upon people; to carry on essential research dealing with the extinguishing of fires caused by various types of incendiaries.

Although we must be prepared to protect ourselves against bomb and gas attacks, the most important aspect of civilian defense for the chemical industry generally is fire defense. In the grim days to come, our men and materials will grow ever more precious. Hence the need for complete fire defense in every plant which produces chemicals grows ever greater.

Every Week Important

As directed by President Roosevelt, the OCD is cooperating with various national organizations in arranging Fire Prevention Week activities that will help reduce the destructive toll of fire. In the chemical industry, there can not be merely one week devoted to this purpose. Every week must be Fire Prevention Week.



Proper maintenance of fire extinguishing equipment is important. In case of carbon-dioxide systems maintenance consists of periodic weighing of cylinders. Here they are being checked without removing from system. *(Walter Kidde & Co. photo)*

These Crown Cans go to the Front!

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PHOTO BY U. S. ARMY SIGNAL CORPS

YOU know how a rifle or shot-gun kicks back when you fire it. Ever stop to figure out what took up the recoil of a big Howitzer, a 90 mm. Anti-Aircraft gun or a 37 mm. Anti-Tank gun?

Well, it's oil that does the trick . . . heavy recoil oil! And just as you use up brake-fluid in your car the time comes when recoil oil has to be replenished.

And that's where Crown Can comes in! Heavy Recoil Oil for the artillery is shipped right up to the front in gallon cans . . . made by Crown . . . to Army specifications . . . and supplied to manufacturers filling these orders.

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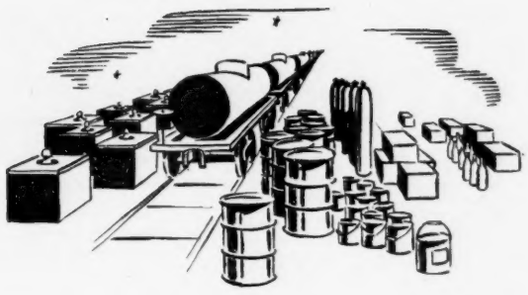


PACKAGING & CONTAINER FORUM

By Richard W. Lahey

Proper Handling of Wooden Barrels

EDITOR'S NOTE: The article "Proper Handling of Wooden Barrels" appearing in this section, has been reprinted from "Oil-Power," a publication of the Socony Vacuum Oil Company. This article comes at a time when so many shippers are substituting tight wooden barrels for steel drums. It should be carefully noted by all users of these containers. The Socony Vacuum Oil Company is to be congratulated on an excellent contribution to bulk packaging for liquids.

THE return of the wooden barrel to industries which had all but forgotten it has brought a number of difficulties. These difficulties will undoubtedly increase as more suppliers of materials turn to these wooden containers in order to meet conditions brought about by the shortage of the more familiar steel containers. Wooden barrels, if well made and properly handled, are good containers and may be expected to give good service. Most of the troubles experienced with them result from the inexperience of those who handle them and are caused by subjecting wooden containers to treatment that has come to be almost the every day lot of the steel drum or barrel. At the foundation of almost every wooden barrel difficulty is a lack of appreciation of the nature of the barrel.

As a matter of fact, the steel barrel and drum will not take as much punishment as is generally believed. A steel container can be dented deeply without causing a break at the point of impact. However, a dent in the surface may mean that the space left at the time of filling for expansion may be entirely eliminated. Subsequently, by increase in temperature or otherwise, the internal pressure may be increased to the point where leakage will develop around a flange or bung opening. The inexperienced may fail to connect the leakage with its cause.

In the case of the wooden barrel, however, the situation is somewhat different. The same rough treatment that will cause a dent in a steel container may leave a wooden barrel seemingly unmarked. Inside and well out of sight, however, damage may have been done that will cause leakage. The loss of product will be apparent enough, but the actual cause of the difficulty may be hidden to anything save careful examination by an experienced cooper. Of course, if the treatment has been rough enough to break a stave or a head, the cause of the damage will be apparent immediately.

Barrels designed to contain petroleum products (and those designed to contain various other liquid products) are made tight by an inner coating of glue. This is applied hot, and the steps that are taken to make certain that the entire inner surface is well covered are most important in the barrel making procedure. If the glue coating is broken, even if the break is not greater than a pin head, the product can find its way to the surface of the barrel. The glue is sufficiently resilient so that the coating will not be injured by the ordinary shocks of transportation, but rough treatment will almost certainly cause breakage and subsequent loss.

For this reason, a wooden barrel should never be permitted to drop even a few inches. When it is unloaded from a truck a skid should be used and the barrel should be "eased down" and not permitted to roll or slide freely. If it is desired to move the barrel from place to place, it should be rolled on its bilge, using skids or a conveyor if the distance is more than a few feet, and it should be "eased" to a stop. If it is permitted to bump into another barrel, damage may be done. Damage may also be done by rolling barrels over cobblestones or tracks.

Barrels are frequently damaged in the course of loading to or from ships, and the chief offender here is the familiar loading net. Loading nets are not advised in the loading of steel drums or steel barrels, but their use with wooden barrels will inevitably result in damage such as broken heads and staves. Equally certain will be damage due to distortion of the package. When barrels are loaded to or from ships, chime hooks or slings may be used. With the sling, approved practice calls for two barrels to a sling with an additional half turn around one of the barrels to prevent slippage.

Wooden barrels stored in warehouses should be tiered on the bilges on skids and not more than four high. The bungs should be up when the package is finally in place. Skids of 2" x 4" lumber are satisfactory. The inside edge of the skids should rest on the outside edge of the bilge hoops on both ends of the barrel, the 4" surface lying flat on the surface of the barrel. Skids should be placed on the floor and between all tiers and tied together to prevent spreading. If wooden barrels are stored in the open, the heat of the sun may be expected to cause shrinkage and consequent leakage.

It should be kept in mind that a wooden barrel is not fastened together. It is a container made of many parts that stay together because of their relationship. The removal of a single hoop or an injury to a single stave may cause the whole thing to collapse. While the proper relationship is maintained, the barrel is a good container. When the relationship is changed, however, the barrel quickly becomes a leaker.

That is why good practice in the handling of barrels calls for constant care to avoid anything that may distort them. Moving a barrel by rolling it on its edge (the "chime") is a frequent cause of distortion and subsequent leakage. A barrel is designed to be supported on its bilge, and permitting a barrel to stand on its head may cause distortion if, indeed, this is not caused by the actual act of "upending it."

However, it is sometimes necessary to make a compromise, and the rule against never standing a barrel on its head when it contains products subject to leakage is one that may justify exception. For example, transportation by truck or box car, because of limited space, may make the head-up position necessary. If so, the barrels should be very carefully examined upon receipt.

The proper way to empty a barrel of liquid is to support it on its bilge on a skid or a rack so that the product may leave the bunghole by gravity. If it is desired to speed the flow, a vent may be

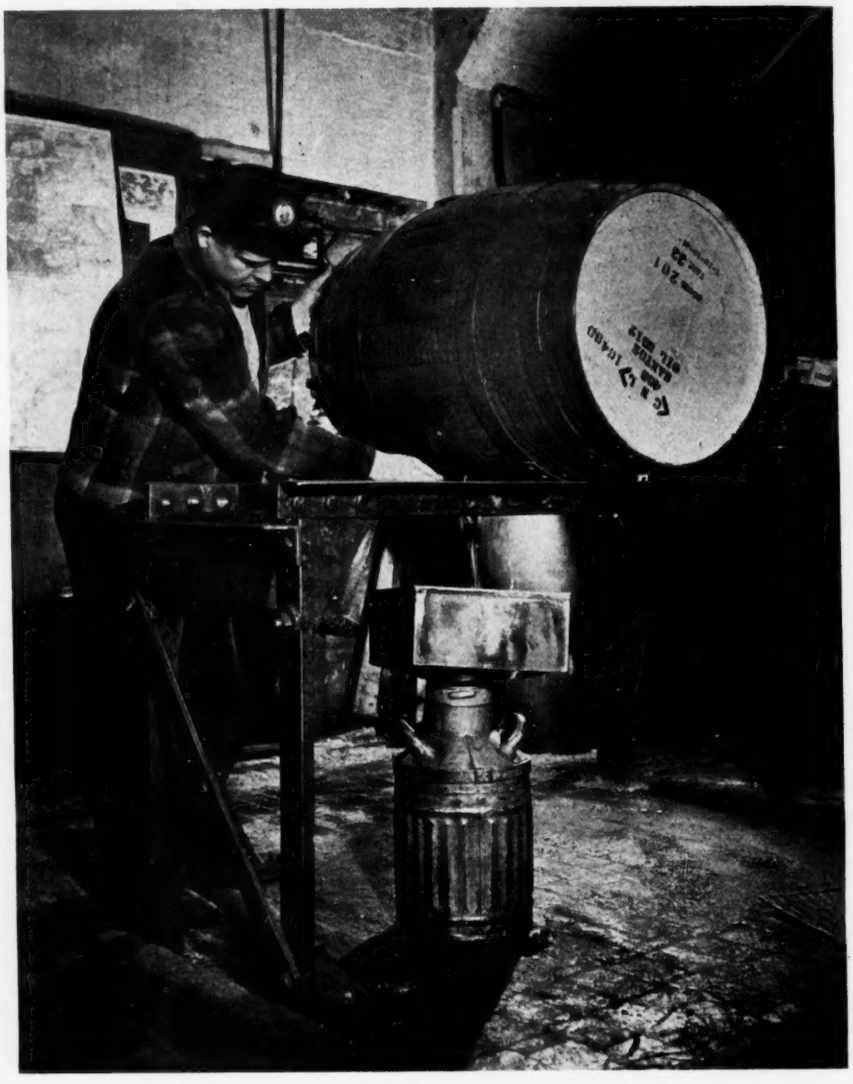
bored in one of the heads after some of the product has been removed. If this is done, great care must be taken to remove any chips or shavings—screening is advised. Usually, a satisfactory vent can be made with the aid of a ten penny nail. In this case only slight damage will be done to the head. Contamination of product may be prevented by inserting a length of one and one-half inch pipe in the bung.

An alternative method is to stand the barrel on its head, bore an opening in the head diametrically opposite the bilge bung (that is, as far away from the bilge bung as possible), insert a tapered wooden spigot or any other suitable type of faucet or gate, lowering the barrel to its bilge position with the bilge bung up. The bilge bung may be loosened or removed to provide a vent. Care should be taken to make certain that any hole made in the head lies *between* the joints. Otherwise, one of the dowel pins that helps to hold the sections of the head together may be cut out and a weakened head and subsequent leakage will result. The hole should never be nearer to the chime than one inch. If it is closer, the forcing in of the spigot may break the wood. Care should be taken to remove chips or shavings from the product.

Pumping from a barrel resting on its bilge is not satisfactory when speed is essential, due to the short pump stroke that is possible. Here a compromise may be desirable as standing the barrel on its head and boring an opening in the upper head may permit the use of a pump with a longer stroke. The position will cause distortion, but it may not be objectionable, or in fact, even noticeable, if the contents are to be removed within a short time. If the use of the barrel is to be continued over a fairly long period, it may be advisable to have the hoops tightened by "driving on" by an experienced cooper.

Boring holes in the head, for venting or for removal of product, is not a desirable practice and should be done only when actually necessary. The additional holes will impair the barrel for re-use until it is repaired.

When barrels are stored in warehouses the approved practice is to have them examined occasionally by an experienced workman who is equipped to tighten hoops to prevent or stop any leaks that may have been caused by the shrinkage of the wood, by distortion or by rough treatment on their way to the warehouse. Considerable judgment is needed. A barrel may be tightened by driving the quarter and bilge hoops a fraction of an inch toward the bilge. However, too much driving is worse than not enough. Instruction from an experienced cooper is advisable before a man attempts to service barrels of product in this way.



For many products, emptying the wooden barrel by gravity is the most desirable practice. (Note: because of limitations of space, all of the illustrations which went with the original article in *Oil Power* could not be used. These photos showed how barrels should be "eased" down a skid, how to roll a barrel, how NEVER to move wooden barrels with a loading net because damage will inevitably result, how to load barrels by chime hooks and by means of a sling, how to "drive" a bilge hoop, and three ways of emptying a barrel through a head—a homemade faucet, a gate and a wooden spigot. Holes for these last fittings were one inch from the chimes.)

Here are points worth remembering by those who, in the present emergency, will renew their acquaintance with wooden barrels:

Don't drop a barrel, even a few inches.

When unloading, "ease" barrels down a skid.

Don't let one barrel bump against another.

Move a barrel by rolling it on its bilge, *never* on its head. If distance it is to be moved is more than a few feet, conveyors or skids, providing two points of contact near the quarter hoops should be used.

Store barrels on their bilges.

Never move barrels in loading nets. Use a sling or chime hooks.

ICC Adds to Explosives Transportation Rules

ON July 14th the I.C.C. announced certain changes and additions to the Regulations for the Transportation of Explosives and Other Dangerous Articles which were made effective on that date and they become mandatory on and after October 15, 1942. All of these changes were published as proposals in the July issue. There are a few additions which have been added due to the emergency.

The changes of principal interest are as follows:

(1) Sec. 61(f)(1) and Sec. 61(f)(3)(a) *Pentolite* has been added to the group of high explosives with no liquid explosive ingredient nor any chlorate.

(2) Sec. 110(a)(4) and Sec. 110(a)(18) the I.C.C. 17E drums authorized for carload and truckload shipments of *inflammable liquids,*

(*Continued on page 387*)

Why did the best castles have round corners? (PACKAGING RIDDLE)

THERE was one big trouble with castles. The first ones were often square-cornered. They were supposed to protect what was inside. But they didn't. They couldn't.

No matter how many loopholes they had, there were always "blind" corners to block vision. Hostile troops could creep up unseen. Further, the stones at the corner were exposed on two sides. And that made them more vulnerable to battering rams.

Square-cornered castles just weren't safe enough! The package *had* to be improved.

New castles were built with round corners. In these circular walls, the loopholes let you see out at *every* angle. And in addition, the curved surface presented a greater obstacle to battering rams.

History books don't refer to the castle builders as "packaging experts." But they actually were. They improved their package to fit their needs.

Producing the right packages to fill America's needs today is the most important job Continental ever tackled. What these packages are, their size, or appearance is unimportant now. The significant thing is that government, like industry, has found that the tin container is an all-around, safe, economical package.

Looking into the future we see many new packages—ideas which must be held until another day. But, for those who are planning ahead, we offer the services of our packaging engineers, research men and designers. They will be glad to work with you.

CONTINENTAL CAN COMPANY

Packaging Headquarters for Industry

What will be the PACKAGE of the FUTURE?

The package of the future will be the package that best meets *all* these 10 important points:

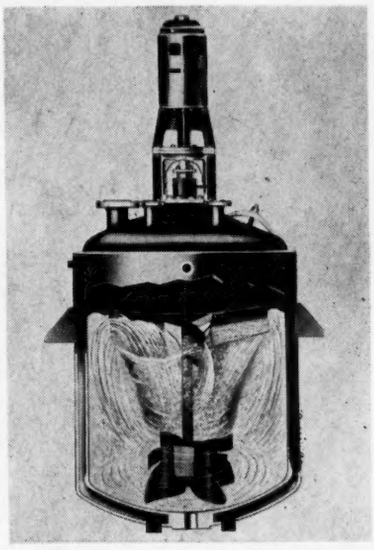
1. Protects against light, heat, and dirt.
2. Does not chip, break, or tear.
3. Is adaptable to *highest* speed filling operations.
4. Is economical to pack, ship, and handle.
5. Light weight, compact, no waste space.
6. Moisture and vapor proof, impervious to temperature changes.
7. Easy and convenient to display, sell.
8. Available in wide variety of sizes, shapes, styles (over 500).
9. Offers maximum convenience and safety in consumer usage.
10. Permits high processing temperatures, certain hermetic sealing.

These points made the metal container *first* in packaging. If there ever is another package that has *all* these qualifications, we'll be making it!

NEW EQUIPMENT

New Agitator QC 190

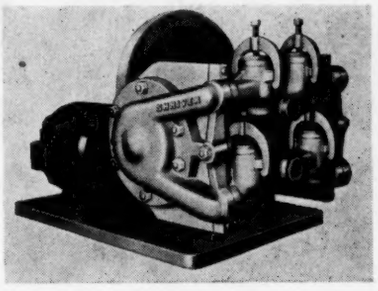
Blaw-Knox Company has developed a new agitator, called the "Rotoflo," for agitating or contacting liquid and liquid; liquid and solid; or liquid and gas. The unit consists of a jacketed shell designed for Dowtherm heating, a high efficiency rotor driven by motoreducer, and special surf-riding baffles.



The baffles are a unique feature of design, and they provide a cataract surface action which improves efficiency at any liquid height and particularly induces rapid gas absorption. The rotor is of special design with upper and lower segments to each blade. This rotor swirls the mass of liquid, creating a central vortex, while the surf-riding baffles divert the top portion of the rotating fluid, plunging it into the vortex. This produces top to bottom circulation and increased surface contact area combined with high rotational velocity.

Diaphragm Pump QC 191

A new design added to the line of Shriver Diaphragm Pumps is the streamlined top feed, bottom discharge unit which is adapted particularly for handling slurries or suspensions which contain a high percentage of crystalline or quick settling solids which may be corrosive, abrasive, heavy or valuable, delicate or hazardous. According to the company the material is fed into the upper manifold through the ball valves and into the heads at each end of the pump in a clean sweeping motion, thereby assuring that with each forward motion of the diaphragm covered piston, the material is forced out through the lower pair of ball valves and out through the lower manifold. This does not permit settling or accumulation of solids in the pump heads.



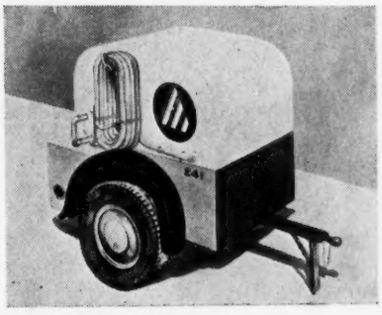
Positive displacement of the material is effected by means of the double acting pistons which are always immersed in a bath of lubricating oil. Since the working mechanism is entirely separated from the liquid heads by rubber diaphragms, there can be no effect by the material on the mechanism. Thus, the only parts of the pump which need be made of whatever metal or rubber covered metal that is best suited to the conditions are the liquid heads, ball valves, and manifolding.

An interesting feature of the pump is the interchangeability of the valve manifolds so that the pump may be fed from the bottom and discharged at the top, if desired.

The pump is made in a complete range of capacities from 1 to 100 G. P. M. and for delivery pressures up to 100 p. s. i. and a suction lift of as high as 18 feet. Any type of motor drive may be applied.

Water Purifier and Fire Fighter QC 192

A completely self-contained, trailer type water purification unit that serves as emergency fire fighting apparatus has been developed by the Technicraft Engineering Company. The unit, called the Sterozone Hydrovan, makes use of ozone to destroy bacteria in contaminated water and deliver for drinking and domestic purposes in areas where water supplies are damaged or destroyed. The Hydrovan is turned into a high pressure fire fighting engine by a simple clutch to cut out the Sterozone purification unit and deliver water at 200 pounds pressure through the 2½" hose. In areas where the water pipe line system has been destroyed, pressure is naturally cut off from the mains and water for drinking and fire fighting must be taken from open storage tanks, swimming pools and other emergency storage.



Operation of the Sterozone Hydrovan makes it possible to purify water for drinking regardless of the length of time it has been in storage. No chlorine or other chemicals are used. Ozone, generated within the unit oxidizes bacterial contamination within a very few minutes and provides

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The Chemical Business Magazine

522 FIFTH AVENUE

NEW YORK, N. Y.

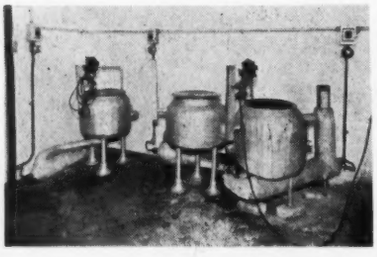
pure drinking water, free from any medicinal or objectionable chemical taste.

The unit is mounted on a two-wheeled trailer and can be taken anywhere a car can be driven. Equipped with 50 feet of 4½″ intake hose and 400 feet of 2½″ fire fighting hose, the Hydrovan permits operation over nearly a 500 foot range from water storage to fire location. The enclosed gasoline engine drives the electric generator and the fire pump. Water can be purified at the rate of 20 gallons per minute or delivered through the fire hose at 200 gallons per minute.

Electrically Heated Kettles

QC 193

Acids and chemicals are heated in the illustrated acid-proof, enamel-lined, jacketed kettles at a midwestern chemical plant. Since direct heat cannot be applied, each kettle is



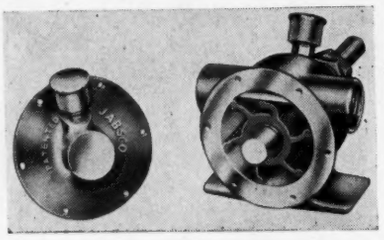
heated by oil which circulates over a General Electric 4-kw Calrod oil-immersion heater and then through the jacket of the kettle.

If necessary, temperatures can be brought up to 270°C. by covering the kettles tightly. Heat is controlled by three-heat switches.

New Pump

QC 194

The Jabsco Pump Company has placed on the market a new type of pump designed to pump either thick or thin liquids without requiring priming each time it is started. As shown in the illustration there is but one moving part—a wear-resisting Neoprene rubber impeller.



Simple in construction and operation, the Neoprene impeller fits snugly inside the pump housing and creates a near vacuum, thus eliminating any need for priming. It is said that the Neoprene impeller allows a certain amount of solids to pass through the pump without clogging or injury.

According to the manufacturer the simple construction and operation of this new pump with but one moving part, tends to reduce friction, cut operating costs and lengthen the life of the pump. All parts except the impeller are of bronze.

Adaptable to fields wherein pressure requirements are low, the pump may be operated in either direction and mounted at any angle. It is available in ¼″ to ¾″ sizes with capacities from 2½ gallons per minute to 22 gallons per minute.

Check Valves

QC 195

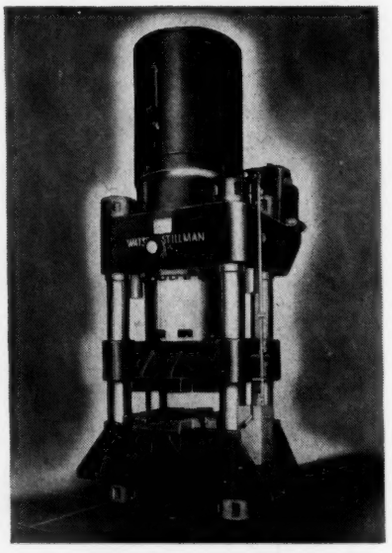
The Williams Gauge Company has announced an improved line of check valves which are furnished in a wide variety of metals and sizes. Designated as the Williams-Hager Flanged Silent Check Valves, they are manufactured of bronze, cast iron, steel, stainless and monel metal for pressures varying from 150 to 2500 lbs. to meet American Standard. Sizes range from 1″ to 20″ inclusive.

These new valves are recommended by the manufacturer for use in waterworks, oil refineries, chemical works, air conditioning systems, hydraulic services, boiler feed, water supply and other non-return flowlines. In general they may be used in all pump lines handling water, oil, gas, acids, alkalies and other fluids.

Forming Press

QC 196

A 1300 ton forming press which can be automatically or manually operated has been recently constructed by the Watson-Stillman Company. It is unusual among larger metal forming presses in its adaptability to single cycle automatic operation or hand con-



trol as required. The unit is entirely self-contained including 50 H. P. motor and radial piston pump delivering 45 GPM. Control is by a single lever latch-operated by a pressure cylinder.

The press is of the vertical 4-column type. Its ram of 35″ diameter exerts a pressure of 2750 pounds per square inch with a 22″ stroke. Opening is 37″ with a clear platen area of 48″ x 42″.

Advance and return speeds are 650″ per minute, with a pressing speed of 10.5″ per minute.

The entire unit, occupying floor space 8′ x 6′ and with an overall height of 19′ is designated machine Number 8661, and weighs 80,000 lbs. It was recently delivered to an aircraft propeller and propeller hub manufacturer.

* * * * * * * * * * * * * * *

For more information, circle the reference numbers on the postcard below. Give your name, company and address. Detach and mail. No stamp required.

Chemical Industries, 522 Fifth Avenue, New York, N. Y.

I would like to receive more detailed information on the following equipment. (Circle those desired.)

QC190 QC191 QC192 QC193 QC194 QC195 QC196

Name ..... (Position) .....

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PLANT OPERATIONS NOTEBOOK

Fuel Cost Chart

By W. F. Schaphorst

We are told to conserve fuel, particularly oil, in our heating, power making, and heat consuming processes in the chemical industries.

At the same time chemical plants are allowed more or less latitude. The government does not intend that important users of fuel shall lose money or waste money by arbitrarily designating one fuel and only one. We are still allowed the privilege of selecting the fuel that is the most economical or best for our particular purpose—provided we can get it.

Whether or not oil is more economical than coal as a fuel, or vice versa, depends primarily on three things: 1—The Locality; 2—The Cost of the Fuel; and 3—The Heat Value of the Fuel.

At the present time, for instance, coal is easier to get in many localities than is oil, and the chances are it will prove to be more economical until the emergency ceases to exist.

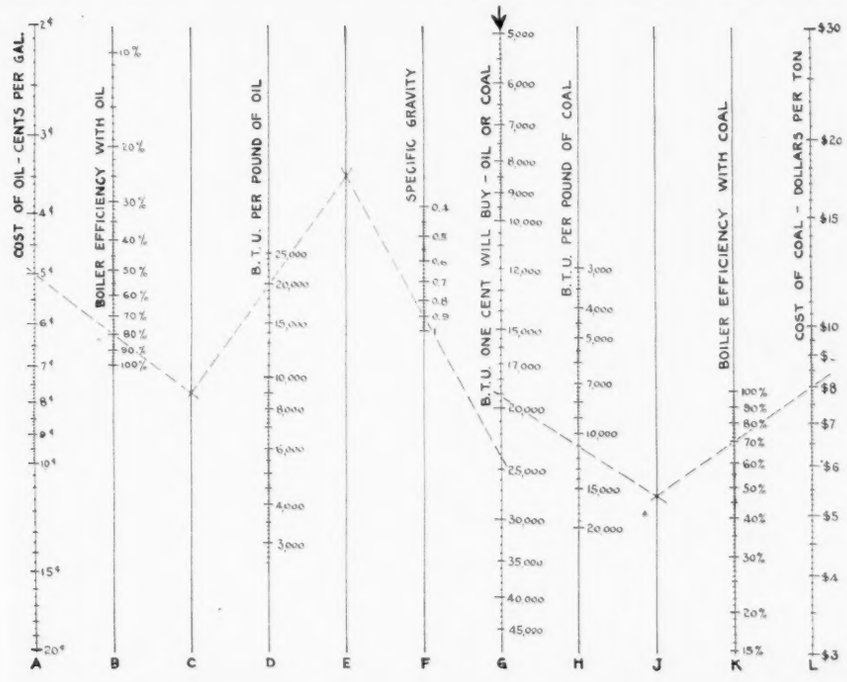
Even in some refineries they are burning coal. Thus one manufacturer of refinery equipment openly stated in an advertisement that some refiners were firing their boilers with coal because of the higher prices they were getting for their fuel oil.

But of course this does not prove that coal is more economical than oil in every locality, even now. It does prove, though, that oil refiners themselves check up heat values carefully and are not averse to the use of coal rather than oil when coal costs less per Btu. That being the case, isn't it logical that chemical plants using considerable oil or coal should do the same?

To assist in checking oil values against coal, here is a chart, prepared by the writer. Simply zigzag through the cost of oil per gallon, column A; boiler efficiency with oil, column B; Btu per pound of oil, column D; and the specific gravity, column F. The intersection with column G then gives the number of Btu's in the oil that can be purchased by one cent.

Then zigzag from the right through the cost of coal, dollars per ton, column L; boiler efficiency with coal, column K; and Btu per pound of coal, column H. The intersection with column G now gives the number of Btu's in the coal that can be purchased by one cent, permitting a telltale comparison with oil.

Thus the dotted lines drawn across this chart show how oil at 5 cents per gallon is compared with coal at $8 per ton. In this special instance one cent will buy 24,000 Btu of oil, or, a little over 19,000 Btu of coal. Oil therefore has the price advantage under the conditions of this particular problem.



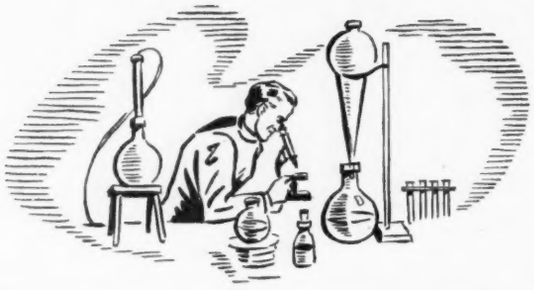
For Efficient Burners

Pointing the way to development of more efficient gas and oil burners for home and industrial use, technicians of the Bureau of Mines and the Carnegie Institute of Technology, Pittsburgh, Pa., have evolved a method which should permit increased accuracy in determining the characteristics of gas flames under various controlled conditions, according to Dr. R. R. Sayers, Director of the Bureau of Mines.

The research is one phase of a study intended to eliminate guesswork in the design and operation of burners and to produce flames of definite physical dimensions with a minimum waste of fuel. Similar methods of calculation can be applied to the combustion of fuel oil to eliminate the trial and error procedures now used, Dr. Sayers added.

In the studies at Pittsburgh, gas flames were used and were examined under a variety of conditions. The investigators made numerous photographs of flames and also determined the temperatures at various points in the flames. The studies also resulted in the determination of the exact conditions which govern "flashback" and "blow-off" in gas burners—two undesirable conditions which engineers seek to avoid in developing safe and efficient burners.

The tests were conducted by Bernard Lewis, senior physical chemist in the Physical Chemistry Section of the Bureau of Mines Central Experiment Station at Pittsburgh, Pa., and Guenther von Elbe of the Carnegie Institute of Technology Coal Experiment Laboratory. Their technical paper, "Stability and Structure of Burner Flames," was presented at a session of the Division of Gas and Fuel Chemistry during the 104th meeting of the American Chemical Society in Buffalo, N. Y., September 7 to 11, 1942.



THE LABORATORY NOTEBOOK

Roots and Powers

By W. F. Schaphorst

Chemists are often "up against" the problem of extracting an odd root, or raising a number to an unusual power.

You can easily make your own device for quickly solving any such problem. Thus if you will take any slide rule and lay it end to end nine times and each time lay off the principal dividing lines you will have a chart exactly like the accompanying chart excepting that yours will be much longer and therefore it will be much more accurate. That is what I did in preparing this chart. Then I reduced it to this much smaller size. By following the above method you can make a chart that will go into the billions, trillions, or higher, as one limit; and a billionth, trillionth, or lower, as the other limit. There is no limit in fact. Then to keep track of the digits you simply read the numbers exactly as they stand on the chart. No juggling of digits is necessary. I do not know of any other method that is as simple as this. All other methods require "juggling of digits," as they say.

For example, what is the 5th root of 100,000? Measure the distance A from 1 to 100,000 as indicated on the chart. The distance B must then be exactly 1/5th of the distance A and there is your answer, namely, 10. In other words divide the distance A by the root and the quotient shows you the distance to measure from 1 to find the answer. Always measure from "1" in either direction.

For example, what is the cube root of .008? Measure the distance C from .008 to the starting point "1" and divide it by 3 and you get the distance D which tells us that the answer is 0.2.

A method that is as easy as any to find a third, fourth, fifth, etc., of any distance, is to use a pair of dividers. Adjust the dividers until you get the distance D exactly 1/3 of the distance C and the chart gives the answer without any mathematical calculations whatever. With this chart you can determine the 3.127 power for instance—ANY power in fact. And you can extract the 4.37 or any other root, all without mathematical jugglery. The "beauty" of it is: You have everything before your eyes in black and white.

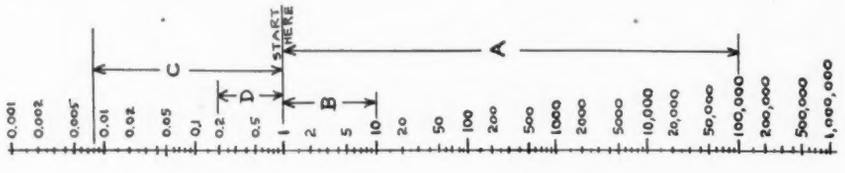
Flask Cleaning Method

A method for removing carbon deposits from distilling flasks has been described by J. G. Campbell of the Houston Laboratories. The method which it is claimed has been used with great success for such deposits, particularly those resulting from gasoline distillation is as follows:

Digest over a low flame, at a temperature slightly below the boiling point, the oxidizing mixture composed of approximately 0.5 g. of metallic mercury (or 0.7 g. of mercuric oxide), 10 g. of potassium sulfate and 25 ml. of concentrated sulfuric acid. Using this low temperature, a hood to carry off the fumes is not essential unless the deposit is large.

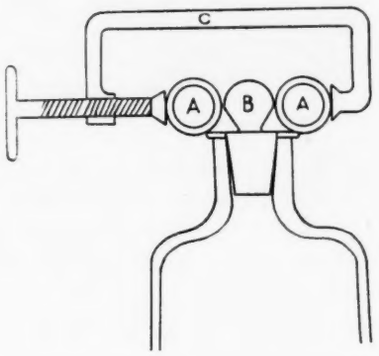
The time required for complete removal of the carbon is usually from 10 to 40 minutes, depending on the quantity of the deposit. The mixture may be transferred from flask to flask after digestion, adding only a small amount of acid to replace that lost during the cleaning operation.

This method requires no attention and leaves no etching, as experienced in using strong solutions of KOH.



Loosening Stoppers

A handy device for loosening frozen glass stoppers and stopcocks is the following, described by Sol Scholnik of Polytechnic Institute of Brooklyn. Two



short lengths of iron pipe, A, are placed on the opposite sides of the stopper, B, and rested on the flange of the bottle. An ordinary clamp, C, is placed in the position indicated by the sketch and the screw is slowly turned until the stopper pops out.

Location of Instruments

Research workers seeking instruments required in their work but difficult to find are invited to communicate with D. H. Killeffer, chairman of the newly appointed Committee on the Location of New and Rare Instruments of the National Research Council. The plan of the committee's activity is to assist in locating needed instruments of types not ordinarily available through accustomed channels.

Assistance is particularly desired from owners and builders of instruments falling within the new or rare categories which might be made available to others through sale or for temporary use under mutually satisfactory conditions. Communications should be addressed to: D. H. Killeffer, 60 East 42nd St., New York, N. Y.

Instruments sought: microammeters and electrical meters generally, ultra-violet microscope, Zeiss Optimeter (for measuring fine wires to 0.00001"). Two circle Reflecting Goniometer (Goldschmidt), Electro-Encephalograph (3 channel), Warburg Apparatus.

The following listed instruments are offered for use by others and inquiries for them are invited:

Instruments offered: Zeiss-Pulfrich Refractometer, Hunter Reflectometer (Infra red reflectance), Coleman Spectrophotometer (complete), Capacigraph (Jnl. of Laboratory & Clinical Medicine, *22*, 1279 (1937); *25*, 175 (1939)). Mechanical Ink Writing Recorder (Am. Jnl. Obstetrics & Gynecology, 40, 330 (1940)). Grating Spectrograph: Focal length 2 meters, Dispersion 8Å/mm, 1st order; Grating Spectrograph: Focal length 8 meters, Dispersion ¼ Å/mm. fourth order.

CHEMICAL SPECIALTIES

New Asco Plastic Cleaner distributed by Aircraft Specialties Corp., Los Angeles, removes grease, masking tape gum, paint, raw rubber, dum-dum, rubber adhesive or any foreign substance from plastics. It is also intended for use in plastic fabrication.

Industrial Agricultural Household

Cleaners for Painted and Varnished Surfaces

Keeping painted and varnished surfaces clean always has been a problem in both home and industry. Possibly this activity will be stimulated in times like these with both labor and home-owner doing other things. Here are some instructions and pointers to make such cleaners.

WITH increasing emphasis on conservation of materials, and with increasing shortage of labor, we must expect to adjust ourselves to somewhat different conditions from those of normal peace times. The redecorating of apartments and homes, and refurbishing of office-building interiors will probably be classed among our less essential items, at least where it is a matter of appearance rather than one of protecting surface materials. A much less expensive method of keeping interiors looking well than that of repainting, however, is to wash the paint. A good paint should last for several years, but any paint will collect soil and eventually become smudged and grimy.

The oily film which builds up on walls and woodwork holds a surprising amount of adherent solid dirt. Besides this general deposit of soil, dark streaks and spots are apt to build up when a chair is placed so that the back rubs against the wall, or where the edge of a desk or table rests against it. Such streaks may not be particularly noticeable until the piece of furniture is moved away from that spot, in which case cleaning becomes absolutely necessary. When such a spot is washed, the clean space it forms reveals the general soil which may not have showed up before. Very little experience is required to convince a person that when he starts to clean a smudge off paint, it is necessary to do a complete job unless the paint is exceptionally clean to start with. Cleaning agents should have good emulsifying and dispersing power to remove the adherent soil mixture.

Cleaning Flat Paint

In apartment dwellings and office buildings the walls are usually finished with a mat texture produced with a trowel or sometimes with special tools, to give a slightly roughened surface. In a few cases a very rough texture is obtained which is impossible to clean. The ordinary mat finish picks up dirt more readily than a perfectly smooth finish. The paint most suitable for this is a flat paint having very little reflecting power or luster. Such paint is highly pigmented and is easy to wash without changing the appearance other than to make it look fresh and clean. The most common paint cleaner and one which works very well is a dilute solution of trisodium phosphate. This alkaline salt appears to have particular virtue as a paint cleaner, being much more satisfactory than a solution of soda ash, for example. Too strong a phosphate solution must be avoided as a concentrated solution is a paint remover; a tablespoonful of the phosphate in a gal-

***One in a series by* C. T. Small, Ph.D.**

lon of water is sufficient to give a solution with good cleaning action.

A product of this type contains the following:

Trisodium phosphate, $12H_2O$	0.7%
Soda ash	0.3
Water	99.0

This dilute solution is sold in an 8-ounce bottle for direct use without further addition of water. It is of course intended for small-scale cleaning such as to take finger marks and pencil marks off walls. Because only a one per cent solution, rinsing afterward is not necessary. The purpose here is to supply a domestic cleaning fluid for painted surfaces comparable to the solvent cleaning fluids for taking spots out of clothing. A similar product sold in gallon cans consists of a three per cent solution of trisodium phosphate. For sale to institutions and maintenance men, the dry salt can easily be packaged in pasteboard with directions for dissolving the proper amount in water.

A powder containing soap has greater detergent value than one based entirely on alkaline salts.

Soda ash	92%
Sodium oleate soap	8

A tablespoonful of this is used in a gallon of hot water. It is recommended for heavy-duty cleaning of paint as when a very dirty surface is to be washed. Such cleaning should be followed by the use of hot rinse water in order to remove as much of the soap as possible from the paint.

A similar product contains a mixture of alkaline salts.

Trisodium phosphate	32%
Soda ash	60
Sodium corn-oil soap	8

This has a little pine oil, less than one per cent, added as odorant.

The following composition gives a paste which has mechanical cleaning action because of the presence of an abrasive.

Soda tallow soap	5%
Soda coconut-oil soap	3
Soda ash	4
Borax	2
Dolomitic abrasive	14
Water	72

Borax in a product of this type is useless if not actually detrimental. The abrasive, mostly calcium carbonate but with some magnesium carbonate, is fairly soft and should not scratch when finely ground. It should pass through a 200-mesh screen. This should be an efficient cleaner, acting much the same as silver polish does on silver, to take off stubborn stains by friction, the soap and alkaline salt acting as detergents and dispersing agents.

A powder also containing abrasive has the composition:

Soda soap	9%
Soda ash	22
Crystalline silica	63
Water	6

This would seem more suitable for cleaning concrete floors than for washing painted walls. The silica in it is a hard abrasive such as might be found in brass polish, and would be apt to scratch paint. A decomposed noncrystalline silica would be preferable. The product is probably sold for a somewhat rougher type of maintenance work than that of homes and offices.

A commercial powdered mixture applies another principle:

Cornstarch	70%
Trisodium phosphate	15
Soda ash	7
Water	8

The powder is stirred with cold water to form a thin cream. With trisodium phosphate and soda ash as cleaning and wetting agents, the somewhat pasty cornstarch acts as an adsorbent to pick up the moistened dirt, the latter sticking to the cornstarch rather than to the painted wall. The creamy mass is spread on the wall then wiped off while still wet, with a clean damp cloth. A thicker mixture can be made for applying to ceilings to avoid the drip of thin liquids.

An antiseptic cleaner suitable for washing the paint in hospitals contains approximately the following:

Trisodium phosphate-sodium hypochlorite complex	65%
Soda ash	25
Sodium metasilicate	10

The phosphate-hypochlorite complex is a commercial preparation containing one per cent of available chlorine. The alkaline salts have a stabilizing action on the hypochlorite when in solution. Silicate is a particularly good dispersing agent for solid soil. Sodium chlorite is a solid salt which has a disinfectant action similar to that of hypochlorite because it acts in much the same way. Chlorite, commercially available for only the last few years, is coming into wider use as a bleach and disinfectant as it becomes better known.

Venetian blinds no doubt deserve their popularity, but they present a real cleaning problem, as anyone knows who has had them for any length of time. Special products have been offered for just this purpose, although in most cases the finish is of flat paint on wood and can be cleaned by the same agents as described above and used for similar painted surfaces. A thick paste contains the following:

Sodium tallow soap	7%
Sodium coconut-oil soap	1
Sodium silicate	3
Water	89

The paste is rubbed over the slats to wet and loosen the soil, and then rubbed off immediately with a clean damp cloth. The paste form prevents dripping of the cleaning agent. The silicate is a siliceous one, the ratio of $Na_2O : SiO_2$ being 1:2. This product, based on soap as a major ingredient, is more of the nature of those for cleaning gloss paint, which we come to now. Some of the Venetian blinds are made of metal with baked-on enamel. These are simple to clean and will stand any of the ordinary cleaning agents.

Cleaning Gloss Paint

Gloss paint or an air-dried enamel finish is often used on the woodwork of doors, door frames, window frames, etc., making a pleasing contrast to the dull wall finish. Gloss paint has a high luster which would be dimmed by cleaning with a solution of strong alkaline salt such as trisodium phosphate. Milder treatment is necessary, a good cleaner being potash soap, potash rather than sodium because of the much greater solubility of the former in cold or luke-warm water.

Its very smooth surface makes this paint easier to clean than a mat finish, so that finger marks, apt to be left on doors and doorframes, can be washed off frequently. The gloss finish is gradually dulled by many washings, however. Gloss paint is rather widely used in hospitals, since the paint must look clean, although it is not necessarily white; there seems to be a psychological reaction against hospitals having all-white interiors.

The use of soap always brings on its own problems, one being that it should not be left on the paint, even when applied in dilute solution, as soap tends to leave a somewhat sticky film unless thoroughly rinsed off the object being washed. This soap film would cause the surface to become dirty more quickly by adsorbing solid soil. Even with rinsing, enough soap may remain on the paint to leave a soap odor.

Another difficulty with soap is the curd it forms in hard water, so that incorporation of a good water softener such as tetrasodium pyrophosphate is of advantage in a soap-base product. These mild products can be used on all types of paint

if rinsed off afterward, in other words anything that can be used on a gloss paint can be used on a pigmented flat paint, although the reverse is not true. Deterioration by washing may be the same in both cases, but is less evident with the flat paint.

The simplest of these products is a plain paste soap.

Potassium linseed-oil soap	30%
Potassium coconut-oil soap	5
Water	65

A sudsy solution is made of this for washing the paint, which is then rinsed off with clear water. The paint is preferably rubbed dry or nearly so. A potash liquid soap such as the commercial liquid soaps sold for dispenser use is entirely suitable for washing paint; these liquid soaps are used quite commonly in hospital maintenance.

Soaps may very properly have added to them a builder in the form of an alkaline salt, provided the proportion of the salt is kept within reason. Too high a proportion of alkaline salt would have a harmful effect; in the right proportion the alkaline salt increases the detergent value of the soap so that less of the latter is required to give the same cleansing action, resulting in a more economical product.

A liquid to be used without dilution has the approximate composition:

Potassium coconut-oil soap	0.4%
Potassium oleate soap	0.3
Soda ash	0.2
Borax	3
Ammonia	1.7
Water	94.4

Although the directions state that no rinsing is necessary, it would certainly seem desirable. Soda ash is a good inexpensive soap builder. Borax is not; the pH of its solution is too low for it to have any but an adverse effect on the dissolved soap, especially as the predominant added salt. While borax has its many uses, promoting the detergency of soap is not one of them.

The following composition probably represents recent trends since silicate is recognized as a particularly good soap builder.

Sodium tallow soap	10 %
Sodium metasilicate, $5H_2O$	3
Soda ash	0.5
Trisodium phosphate	0.7
Water	85.8

This concentration of hard soap produces a paste rather than a liquid. Ease of rinsing would be greater with an oleate soap and even more so with a potash oleate soap. With a sodium tallow soap, hot or at least warm water should be used to rinse away the detergent film. The proportion of alkaline builder here seems a little high for use on gloss paint, especially since all three salts are fairly strong alkalies.

Much the same type of product can be used on varnished woodwork as on gloss paint, although even milder cleaners have been devised for the purpose. An example is the following:

Potassium oleic-acid soap	6%
Triethanolamine oleic-acid soap	6
Free triethanolamine	2
Water	86

The manufacturer recommends the use of an ounce of this liquid in a gallon of water. The presence of triethanolamine, an exceedingly mild base, and its soap, makes this a more neutral product than those preceding, also a more expensive one.

A more concentrated but also nearly neutral product is a super-fatted soap of a jelly-like consistency.

Potassium corn-oil soap	35 %
Free corn oil	0.5
Water	64.5

A small amount is dissolved in water for use. This exceedingly mild soap should have no harmful effect on gloss. The presence of unsaponified fat presents the usual problem of possible deterioration of the product. It also makes rinsing more difficult, so that more of a film may remain to pick up dirt. A good oleate soap plus tetrasodium pyrophosphate is about as good as any of the special products.

A cleaner which has almost the nature of a furniture polish contains a mixture of kerosene and water partially emulsified with soap.

Kerosene	60%
Triethanolamine soap	5
Water	35

The emphasis placed on this by the manufacturer is its harmless nature. It should be a good cleaner, the kerosene dissolving greasy matter and leaving a very light film of its own to promote luster. After application, the surface is wiped with a damp cloth. All furniture polishes except the straight oil type are expected to clean as well as to polish. A typical example contains 25 per cent of mineral oil, eight or 25 per cent of sulfonated oil, and the balance water. The sulfonated oil acts as the cleaner and emulsifying agent; one proportion gives a water-in-oil emulsion, the other an oil-in-water emulsion. The mineral oil leaves a luster. Where a gloss paint has to undergo frequent cleaning, the presence of a little emulsified oil is a good thing to help maintain the luster.

Another kerosene-water mixture contains:

Sodium tallow soap	6%
Kerosene	17
Colloidal clay	7
Water	70

A colloidal clay such as bentonite acts as a dispersing agent to promote emulsification of kerosene and water and give a liquid homogeneous in appearance. The solid tends to collect in cracks, from which it is difficult to remove. Soap is an emulsifier and cleaning agent.

Cleaning Waxed Floors

A cleaner for waxed floors that has merit can be made up with the following ingredients:

Potassium linseed-oil soap	9 %
Fatty alcohol sulfate	0.5
Pine oil	3
Soda ash	1
Water	86.5

This liquid should have good dispersing power, which would be particularly needed in cleaning floors. The fatty alcohol sulfate is of the nature of Gardinol or Duponol. There seems no good reason to add this small amount to soap. Like soap it is a good detergent. Its resistance to hard water would be of little value in the presence of this relatively high proportion of soap. Present principally as an odorant, the pine oil might have some germicidal value in this concentration. Soda ash serves as soap builder.

Synthetic detergents, including fatty alcohol sulfates, are most useful by themselves to replace soap in hard-water districts. Even at a somewhat higher price, they can be expected to compete successfully with soap in the rather large hard-water areas of the country. As suggested before, the answer to incorporating soap and still have a product for general distribution is to add a suitable proportion of sodium hexametaphosphate or of tetrasodium pyrophosphate. These water-softening salts prevent the formation of precipitates, since they react to form soluble complexes with the hard-water ingredients. Unlike them, trisodium phosphate and soda ash are water softeners by virtue of their reaction to form insoluble magnesium and calcium compounds. The latter are easily rinsed away while calcium and magnesium soaps are not, being sticky and gummy in nature.

The soap-base products for gloss paint are also suitable for washing linoleum and similar alkali-sensitive surfaces. Linoleum has an oxidized-oil base just as paint does. An excellent product for cleaning linoleum or leather, or for the frequent cleaning of gloss paint or varnish, is one similar to saddle soap. For example, a well known saddle soap has a potassium oleate base with an excess of neatsfoot oil. This leaves a light film of oil and is used particularly for cleaning fine furniture.

The cleaning agents discussed, based on soap, are often advertised for cleaning leather as well as varnished and painted surfaces. In fact, they constitute good general cleaning agents, as may be recognized by those familiar with detergent products.

Packaging and Container Forum

(*Continued from page 380*)

flashing below 20°*F.* has been extended to less carload and less truckload shipments.

(3) *A new specification* 5*L metal drum* of not over 5 gals. capacity has been authorized for *gasoline shipments* offered by or consigned to the War or Navy Department of the U. S. A. or Allies.

(4) Sec. 113(f)—Covers exemptions for *small shipments* of *paints, enamel, lacquers, etc.* Shipments in inside containers, glass of not over 1 quart capacity each and metal of not over 5 gallons capacity each, are included in this exemption. Truck and freight shipments will be completely exempt from all regulations, water shipments will be exempt except name of contents must be shown on shipping container and I.C.C. labels are required, and express shipments will be exempt except I.C.C. label is required as prescribed in Sec. 404(e). When the fiberboard box is used for any shipment, gross weight must not exceed 65 pounds.

(5) Sec. 184(a) *Nitrocellulose colloided,* granular, or flake wet have been added to this section of the Regulations.

(6) The *37G single trip metal drum* has been added to the approved list of containers for the shipment of *potassium permanganate,* an inflammable solid.

(7) Sec. 264(o)(2) Add to the list of approved cylinders for transportation of *anhydrous hydrofluoric acid* seamless cylinders I.C.C. 3E if not brazed.

(8) Sec. 346(b) To the list of authorized cylinders containing *methyl bromide,* the I.C.C. 3E—1800 seamless cylinders have been added. All of the other provisions of this section are unchanged.

(9) Sec. 357(a)(12) The I.C.C. 21A fiber is added to the list of *cyanide containers.* The maximum loaded capacity is set at 225 lbs. net. The 21A drum is to contain one added ply of asphalt laminated kraft 30/60/30 basis weight in side walls and heading (metal heading excluded). This drum must also withstand 2 drops from a height of 4 ft. or one 6 ft. drop in place of the drop test as provided in the 21A specification.

(10) Sec. 361(9) Note. *Tape* used for covering seams of fiber board boxes holding Class B. poisonous solids in prescribed inside containers is reduced in width to 2½" from 3".

(11) Sec. 361(K) The weight of *Class B. poisonous solids* now authorized at 115 lbs. net in the I.C.C. 21A fiber drum is increased to 225 lbs. net.

The same proviso's for an extra asphalt laminated ply in the sidewall and heading and added drop tests as prescribed under No. 9 above apply in this instance.

(12) Sec. 402(p) Shipments in carload and truckload lots by freight, express, or over the highway and when unloaded by consignee are not now required to be *labeled.* This change also exempts such shipments from marking name of contents on containers. The exception does not apply to Class A and Class C poisons.

(13) Container Spec. 2J, 2K, 2L, 12B, 13, 22A, 36B, 36A, 44B, 45B. The ream of paper consisting of 480 sheets size 24"x 36" is changed to 500 sheets of the same dimensions.

(14) Specification 5*L metal drums* listed under No. 3 above has been added to the I.C.C. container specifications. This is the so called "blitz can" which was designed by the Army for refueling their tanks and other armored vehicles. It follows the 5A drum specification and is limited to a maximum of 5 gallons in size. It is fabricated from a minimum of 20 ga. steel and is rectangular in shape.

(15) Container Spec. 12B, 12E, 22A. The kraft *tape* specified may be reduced in width from 3" to 2½".

(16) Container Spec. 22A — *Plywood drums.* Certain changes in the detail of this specification concern hoops, head liners, head battens, and closure of heads.

(17) *Tank Car* Spec. 103B. 25 tank cars may be equipped with special safety vents equipped with porous carbon cylinders. These cars are for use in transporting hydrochloric acid 20°Be and weaker.

Stop These Accidents!

The following is copied from the issue of last October 1st of *The New York Times*:

"STEEL DRUM BLAST
KILLS MAN."

"Mineola, L. I., Oct. 1.—Louis Bartles, 28 years old, of Hicksville, L. I., an employee of a blacksmith shop at 23 Heitz Place, there, was killed instantly in the shop this morning by an explosion within an empty steel drum as he was cutting off the top with an acetylene torch. The torch apparently ignited fumes that remained in the drum after it had been drained. The top hit Bartles in the head. The barrel is believed to have contained a weed-killing chemical and was one of several taken to the shop from the Burrille estate at Jericho to have the tops removed. Nassau County police ordered a chemical analysis of the dregs."

EDITOR'S NOTE: *This man was killed because of someone's carelessness. So-called empty drums which actually contain inflammable or explosive fumes are always dangerous. Emptiers of drums containing inflammables should be forced to wash out drums before they find their way into the hands of those who are ignorant of their hazards. This danger should be publicized for the protection of the public.*

Interesting step in the manufacture of a wooden barrel. Note the construction.

This and the photo on page 380 are reproduced through the courtesy of "Oil-Power."

COLUMBIA CHEMICALS

FOR BETTER GUN TUBES—OR GAS MASKS . . .

Whether the tools for winning this war are made of steel, rubber, aluminum, glass, fabrics—or any of countless other materials, Columbia Chemicals play an important part not only in speeding their production, but in assuring improved performance qualities. Obviously, these essential chemicals contribute toward keeping man-hours productive all along the line. In the case of Liquid Chlorine, for instance, we are gladly adhering to strict allocation of our entire production. As for many other Columbia Chemicals, we are fortunate in being able to maintain production somewhat ahead of current demand as a means of assuring adequate supplies for any future increase in the nation's requirements.

ESSENTIAL INDUSTRIAL CHEMICALS

SODA ASH • CAUSTIC SODA • SODIUM BICARBONATE • LIQUID CHLORINE • SILENE* CALCIUM CHLORIDE • SODA BRIQUETTES MODIFIED SODAS • CAUSTIC ASH • PHOSFLAKE CALCENE** • CALCIUM HYPOCHLORITE

*Precipitated Calcium Silicate **Precipitated Calcium Carbonate

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY

COLUMBIA CHEMICAL DIVISION

GRANT BUILDING, PITTSBURGH, PA.

CHICAGO • BOSTON • ST. LOUIS • NEW YORK • CINCINNATI

CLEVELAND • MINNEAPOLIS • PHILADELPHIA • CHARLOTTE

BOOKLETS & CATALOGS

Chemicals

A406. *Acid-Proof Cement.* Booklet No. 6. 8-Page booklet presents data together with photographs and charts showing installations and methods of installation. The "how to use" section has been brought up to date, while chemical, physical and electrical properties are presented in detail. Pennsylvania Salt Manufacturing Co.

A407. *Bakelite Laminating Plastics.* 24-Page booklet tells what laminated plastics are and describes their various types, including molded laminated stock, engraving sheet stock, fluorescent and phosphorescent sheet stock, and densified laminated wood. The booklet is well illustrated with photographs showing the manufacture of laminated materials and their essential uses in the electrical, automotive, aircraft, and chemical industries. Bakelite Corporation.

A408. *Betz Indicator.* Sept., 1942. 8-Page house organ describes in this issue lime and soda softening or the process by which the calcium and magnesium content of water are chemically precipitated and removed through the use of calcium hydroxide and sodium carbonate. W. H. and L. D. Betz.

A409. *Iodine.* The current issue of "Iodine Facts," published in England is devoted to the use of iodine in the hygiene of war. Iodine Educational Bureau.

A410. *Koroseal.* Section 1 of a Handbook of Technical Information contains 24 pages which tells the nature and chemistry of Koroseal, physical properties, plasticizers, stabilizers and pigments used in compounds, together with mixing and processing procedures. Of special value are six charts; a manufacturing flow sheet, specific viscosity vs. physical properties, effect of quantity of plasticizer, electrical effects of aging, differences in plasticizers and physical effects of various pigments, as well as two tables, one on physical constants and the other on plasticizer comparison. The B. F. Goodrich Co.

A411. *Plastic Products.* 16-Page Booklet gives information covering plant and production of R. D. Werner Company, Inc.

A412. *Plastics from Agricultural Materials.* 52-Page bulletin containing report by O. R. Sweeney and L. K. Arnold gives in detail such information as the effect of varying the raw material combinations, molding conditions, time and temperature of cooking, and other procedures, together with specific recipes for the plastics judged best after many years of study and experimentation. Iowa Engineering Experiment Station.

A413. *Rubber Guide Book for American War Industries.* 30-Pages designed to present maximum information in easily accessible, indexed, condensed form, lists the applications and properties of many types of products for industrial and aeronautical purposes using natural, synthetic or reclaimed rubber.

Well illustrated throughout, the booklet is divided into 11 indexed sections, under the following headings:

Properties of Ameripol (synthetic rubber compounds developed by B. F. Goodrich) hydraulic equipment parts, sponge products, industrial rubber gloves, extruded rubber goods, Anode process of rubber coverings, industrial and aeronautical molded goods, hard rubber parts, rubber cements, lathe cut rubber goods, and properties of reclaimed rubber.

Sub-zero test data, diameter, volume, thickness and hardness tests in oil, and suggested uses for various Ameripol compounds are also given in clear, easy-to-read manner. Cross-sectional drawings add to the clarity of the presentation.

One of the most pertinent chapters in the synthetic rubber section is that devoted to the properties of Ameripol compounds used in handling aromatic, Asiatic or loaded fuels.

Other features include the listing of principal molded goods, and a review of sponge, lathe cut and hard rubber processes using either natural, synthetic or reclaimed rubber. The B. F. Goodrich Co.

A414. *Silicate P's & Q's;* Vol. 22, No. 8. 2-Page looseleaf sheet discusses silica gel in an interesting fashion. Philadelphia Quartz Co.

A415. *Terpene Solvents.* 21-Page booklet discusses properties and applications of a series of terpene solvents. The booklet emphasizes that while turpentine, which is composed of terpene hydrocarbons, has been used for many years as a solvent and thinner for protective coatings, it is but one of various terpene solvents available today. Thinners and solvents detailed in the booklet have been grouped under five classifications in accordance with their major constituents, as Bicyclic Terpene Hydrocarbons; Monocyclic Terpene Hydrocarbons; Terpene Alcohols; Terpene Ethers; and Terpene Ketones.

Included in the booklet are technical graphs on A.S.T.M. boiling ranges and distillation ranges and on the evaporation rates at 100° C. of Hercules terpene solvents. Structural formulas are pictured, together with tables of typical analyses, citing specific gravity, refractive index, unpolymerized residue, flash point, Kauri-Butanol solvency value, aniline point, Ubbelohde viscosity and color. Blending of terpene solvents by research chemists at the company's Experiment Station has yielded certain preliminary data on typical blends included in the booklet. Hercules Powder Co.

A416. *Tin.* The current issue of "Tin and Its Uses" (No. 13) is devoted to emergency economies in tin. Tin Research Institute.

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A417. *Vinylite Resins, Their Forms, Properties, and Uses.* 20-Page booklet describes the four major types of vinyl resins and the various plastic materials produced from them including, Rigid Sheets, Flexible Sheeting and Film, Molding and Extrusion Compounds, Adhesives, and Resins for Surface Coatings. In addition, the booklet contains tables of properties as well as charts showing the principal applications of Vinylite plastics. Carbide and Carbon Chemicals Corp.

Equipment — Containers

E719. *Automatic Control of Synthetic Rubber Processes*; Bulletin No. 103. Gives information concerning the application of automatic control instruments on synthetic rubber processes. Bulletin is well illustrated with typical installations and sketches showing how the instruments are applied. The Bristol Co.

E720. *Belts and Pulleys*; Bulletin No. 3001. Describes and illustrates the "Belt-Saver" tail pulley which the company claims will prolong the life of conveyor and elevator belts and pulleys. Sprout, Waldron & Co.

E721. *Corrugated Shipping Boxes.* Handy guide points out shipping economies. The booklet discusses all phases of shipping from the receipt of containers until packed container arrives at destination. The Hinde & Dauch Paper Co.

E722. *Electric Controls.* 36-Page catalog describes, illustrates and gives specifications for electrical controls for heating, ventilating, air conditioning, and other industrial applications. Barber-Colman Co.

E723. *Electronic Tubes.* 4-Page folder gives comprehensive, quick selection chart of electronic tubes for industrial use. General Electric Co.

E724. *Flexible Coupling*; Bulletin No. 642. Describes, illustrates and gives engineering information on flexible couplings for the correction of misalignment and lateral float in driving shafts. W. H. Nicholson & Co.

E725. *Fluorescent Lighting.* 8-Page folder describes and illustrates the "Fluor-a-beam" line of fluorescent lighting fixtures. Fluor-a-beam, Inc.

E726. *Heat Exchanger.* Bulletin 1621 outlines the distinctive features and advantages of this leakage-proof unit, known as the G-R Tubeflo Section; and includes a concise tabular comparison between its design characteristics and those of shell-and-tube exchangers. It also describes the principal applications for which these units are particularly adapted, and quotes typical service records in which they have maintained heat transfer rates in difficult operating conditions; such as handling heavy crude oil, clay bearing oil, still bottoms, molten salt and liquids at extreme pressures and temperatures. The Griscom-Russell Co.

E727. *Liquid Density Recorders.* Bulletin A-264 illustrates and describes instruments for the automatic measurement and recording of densities of process liquids.

In place of periodic readings by hydrometer and still samples, the Foxboro Density Recorder records the continuous, direct measurement of the flowing liquid. For processes where automatic control of density is important for operating efficiency, the Foxboro Stabilog Density Controller is supplied. The instruments have identical measuring systems and both use standard Foxboro charts, which may be read in specific gravity, Baume, Brix or other recognized scales. Charts may be read to small unit values, and the accuracy of the measuring and recording is not affected by turbulence, viscosity or by foam. Installation of either instrument is relatively simple. Auxiliary equipment for the installation is also shown in the bulletin. The Foxboro Company.

E728. *Machine Tool Accessories.* 8-Page bulletin describes and illustrates line of accessories including live centers, metal etcher, demagnetizer, grinding wheel dresser, balancing ways, variable speed pulleys, electric marker, and portable cleaners. Ideal Commutator Dresser Co.

E729. *Machining Alcoa Aluminum and Its Alloys.* New 44-page edition of the company's standard booklet on machining. It sets forth the general principles of machining aluminum and its alloys; suggests speeds, feeds, and depth of cut which will produce satisfactory results; points out where practices and tools common to other metals may be used; and indicates where special practices or tools are desirable. Part 1 deals with general machine shop practice. Part 2 describes the practices employed in automatic screw machine operations. Aluminum Company of America.

E730. *Magnetic Separators.* Bulletin No. 25-C. Describes the design, construction and material embodied in the company's suspended magnets, illustrates applications, and gives specifications on circular and rectangular types. Stearns Magnetic Manufacturing Co.

E731. *Plant Liquidations.* Folder lists process machinery available from the liquidation of plants or factories. Brill Equipment Corp.

E732. *Pump Strainers.* Comprehensive bulletin stresses the importance of protecting pumps, through the use of strainers in the intake lines, and illustrates with cross-sectional the operation of four types of strainers. Blackmer Pump Co.

E733. *Spray Nozzles.* A new illustrated folder describes Rex Spray Nozzles. The illustrations of this ingenious device in the folder show various uses which range all the way from cooling fruit in packing plants and cleaning trolley buses in garages to washing logs in lumber mills or descaling sheets and plates in steel mills. Chain Belt Co.

* * * * * * * * * * * * * * * *

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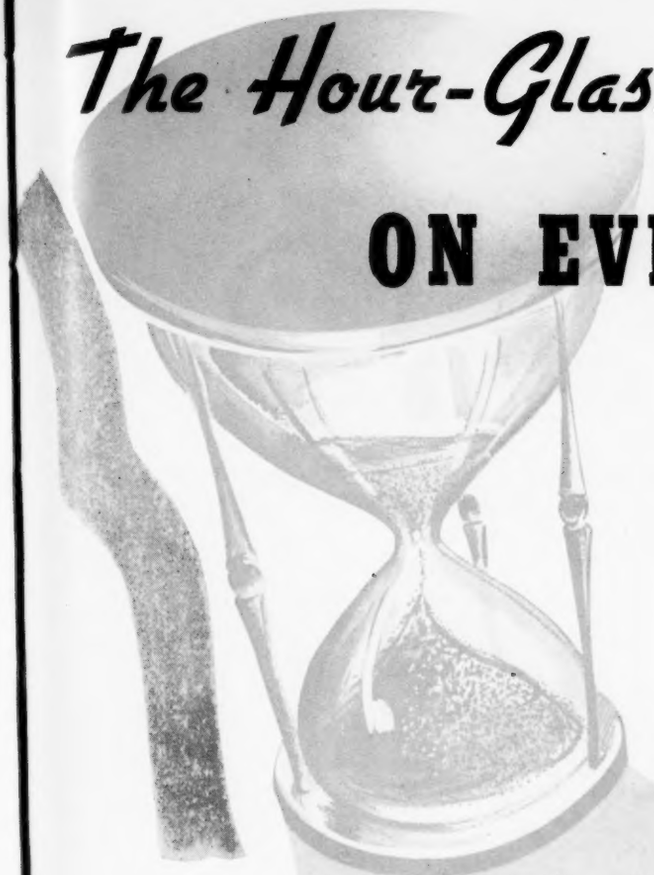
The Hour-Glass Casts Its Shadow

ON EVERY WAR PROJECT



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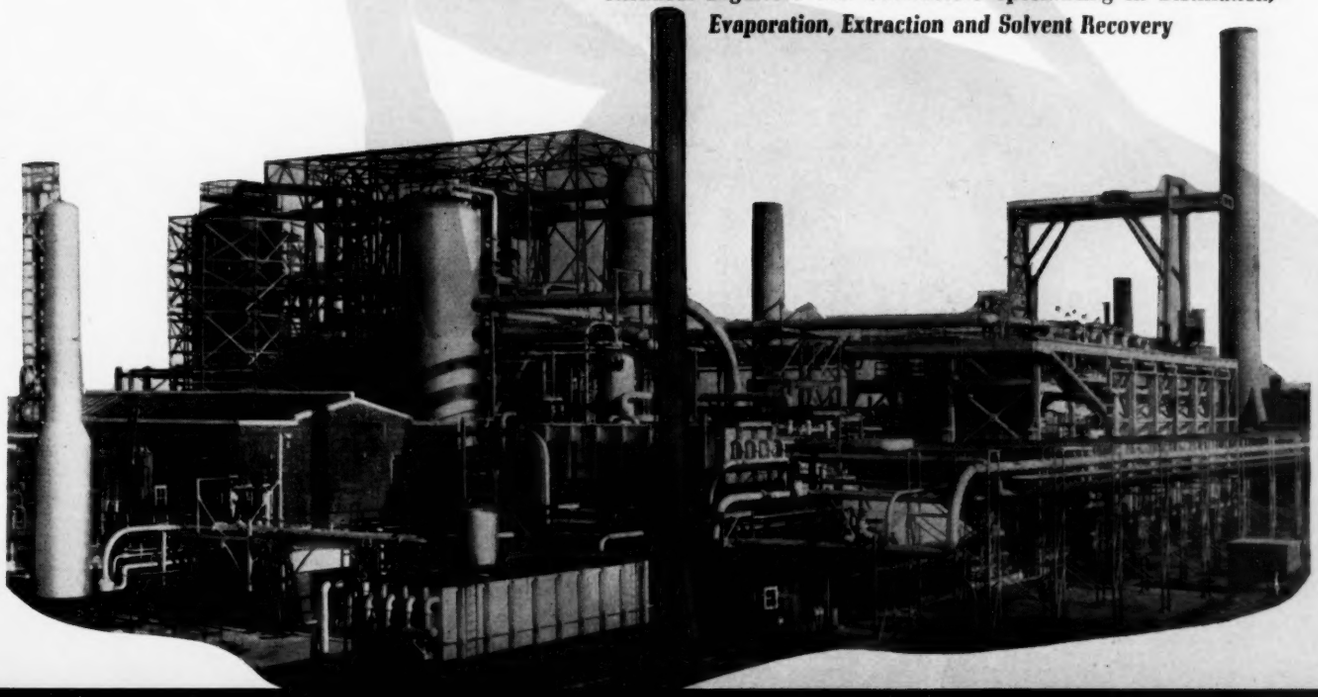
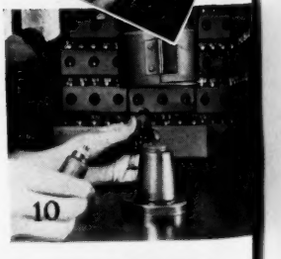
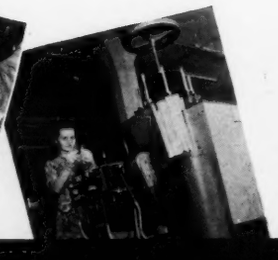


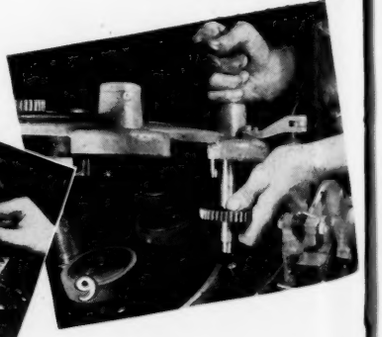
Resistoflex, Synthetic Resin, Replaces Scarce Rubber in Many RCA Manufacturing Processes

RCA Manufacturing Co., highly dependent on rubber in many of its manufacturing processes, started experimenting with Resistoflex PVA materials a little over a year ago. Today it has supplanted rubber and synthetic rubber with this material in over 15 applications. In nearly every case, the "substitute"—a flexible, resilient synthetic resin—is outlasting and outperforming the original material.

(1) A workman at RCA cuts a ball mill gasket from a sheet of Resistoflex. (2) Fixing the cover on a ball mill jar prior to placing it in the rotating unit. A gasket made of Resistoflex sheet material, unaffected by the chemicals ground in the mill, is used to seal the cover to the jar. (3) A workman installs a Resistoflex vibration block on a wire cutter. The blocks themselves can be seen at the bottom of the picture. The light-colored block was made of a standard compound and had to be drilled to increase its resiliency. A new compound (dark block in the picture) was then formulated to give the exact hardness and elasticity required in this critical operation. (4) How a Resistoflex tube made from rolled sheet is used as a suction line on a sandblast machine. (5) A sheet Resistoflex shield protects the operator's wrists in a sandblast machine for cleaning small parts. (6) Resistoflex hose is here shown in use as gas and air line connectors on an automatic machine. In the RCA plant several applications of this type are now in use with the new material replacing large quantities of rubber tubing. The hose shown here have a Resistoflex PVA material core and a braided cotton outer jacket. (7) Another use of Resistoflex hose for gas-air line connectors. Here the synthetic replaces flexible metal tubing. (8) A conveyor belt on a machine making small parts. On this operation the Resistoflex belt replaces one made of woven wire and has proved superior in that the parts cannot get caught in or stick to the solid Resistoflex sheet. (9) Another use for Resistoflex is power transmission rings for revolving turret head machines. On these machines rings of Resistoflex are attached to power driven shafts. As the head of the machine revolves a shallow tooth gear is brought into mesh with the revolving Resistoflex ring which transmits power for that individual operation. (10) A Resistoflex aligning ring used to replace rubber in an operation for clinching metal parts on tubes. (11) The jaws of this forming press used for small parts are lined with Resistoflex sheet which is cemented directly to the metal. Use of the synthetic compound in this one operation has resulted in tremendous savings for RCA.







ETHYL MONOETHANOLAMINE
ETHYL DIETHANOLAMINE

SPECIFICATIONS

	ETHYL MONOETHANOLAMINE	ETHYL DIETHANOLAMINE
Color	Water white	Water white
Specific gravity at 20°/20° C.	0.92	1.02
Minimum Amine Content	98.5%	98.5%
Initial Boiling Point	161.0° C.	245.0° C.
Final Boiling Point	174.5° C.	260.0° C.

OTHER PROPERTIES

Flash Point	160° F.	255° F.
Solidification Point	−8.8° C.	−50° C.
Refractive Index at 20° C.	1.444	1.466
Viscosity at 25° C. (Centipoise)	12.40	53
Viscosity at 60° C. (Centipoise)	3.22	11.2
*Coefficient of Expansion per deg. C.	0.00091	0.00080
Theoretical Molecular Wt.	89.1	133.2
Average Weight per gal.	7.66 lbs.	8.5 lbs.
Solubility in:		
Water	Soluble	Soluble
Alcohol	Soluble	Soluble
Ether	Soluble	Soluble
Benzene	Soluble	Soluble
Paraffin Hydrocarbons	Soluble	Slightly Soluble

*Calculated

SHARPLES TRADE MARK CHEMICALS

These two alkylamino ethanols are obtained as co-products and can be supplied either separately or as a mixture, the composition of which is subject to variation within moderately wide limits. For many applications the use of a mixture of the two may be more economical because of the lower price.

These products are suggested for investigation as intermediates for the pharmaceutical and dyestuffs industries. Their fatty acid soaps and other derivatives such as esters and amides are very low in odor and exhibit interesting properties as emulsifying, wetting and penetrating agents.

Sharples will be glad to discuss these relatively new chemicals with those who may be interested in trying them for the solution of either new or old problems.

The 13th edition of "Sharples Synthetic Organic Chemicals" has been published just recently and if your copy has not been received one will gladly be sent on request.

SHARPLES CHEMICALS INC.

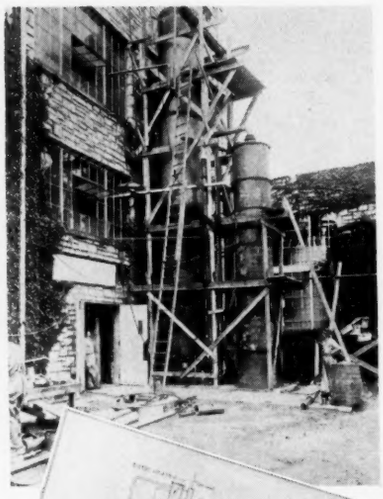
PHILADELPHIA CHICAGO NEW YORK

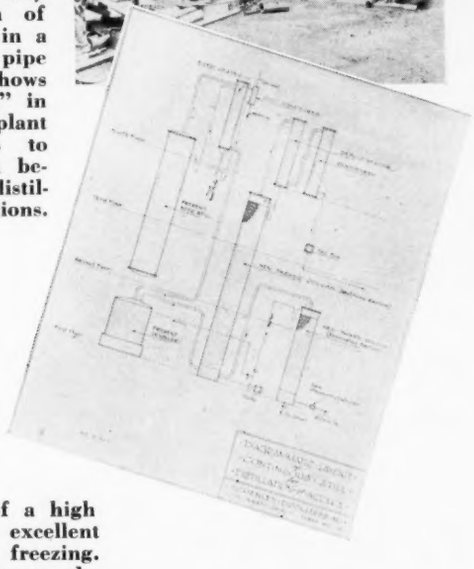
Shots from Here & There in the Chemical Industry

Shown above are new members of the staff of the Central Technical Laboratory of the Armstrong Cork Co. Front row, left to right: Warren Stubblebine, Melanie Pollack, Louise M. Hartzell, Charlotte Witmer, Josephine Van Der Voort, Lois J. Hunter, Ruth A. Ruggy, Vera B. Warner, Sara L. Jordan, Virginia H. Smith, Adolphus J. Brunner. Second row, left to right: Wilma E. Weisgerber, Virginia C. Hole, Frances Findley, Antonio Boissevain, Mary M. Talmage, Virginia Williams, Elizabeth P. Belcher, Catherine C. Schultheis. Back row, left to right: Raphael H. Stafford, Arthur W. Weidner, E. Kieth McMahon, Amos L. Miller, Harold E. Adams, John M. Sharf, Roger G. Brown, Irving E. Adams, M. Smyser Lewis.

•

Schenley Distillers Corp. recently announced a new "packed column" method which radically shortens the time for converting beverage distilleries to plants producing alcohol for the war effort. All that is required for this new method is the re-arrangement of existing distillery equipment and the addition of small brick-tile rings packed in a shell made of old tanks, tile pipe or cypress staves. Top photo shows a completed "packed column" in operation at a Schenley plant converting low-proof spirits to high-proof alcohol. Diagram below shows re-arrangement of distillery equipment and re-connections.





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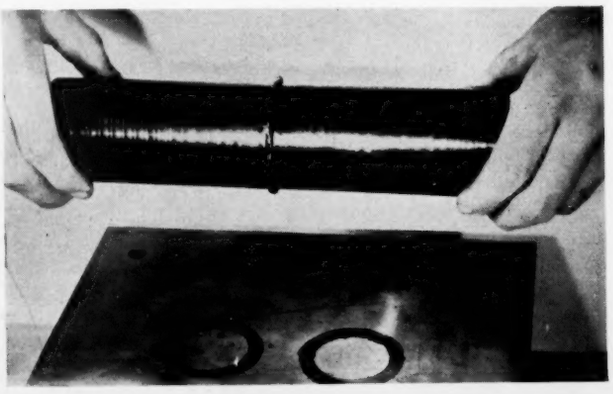
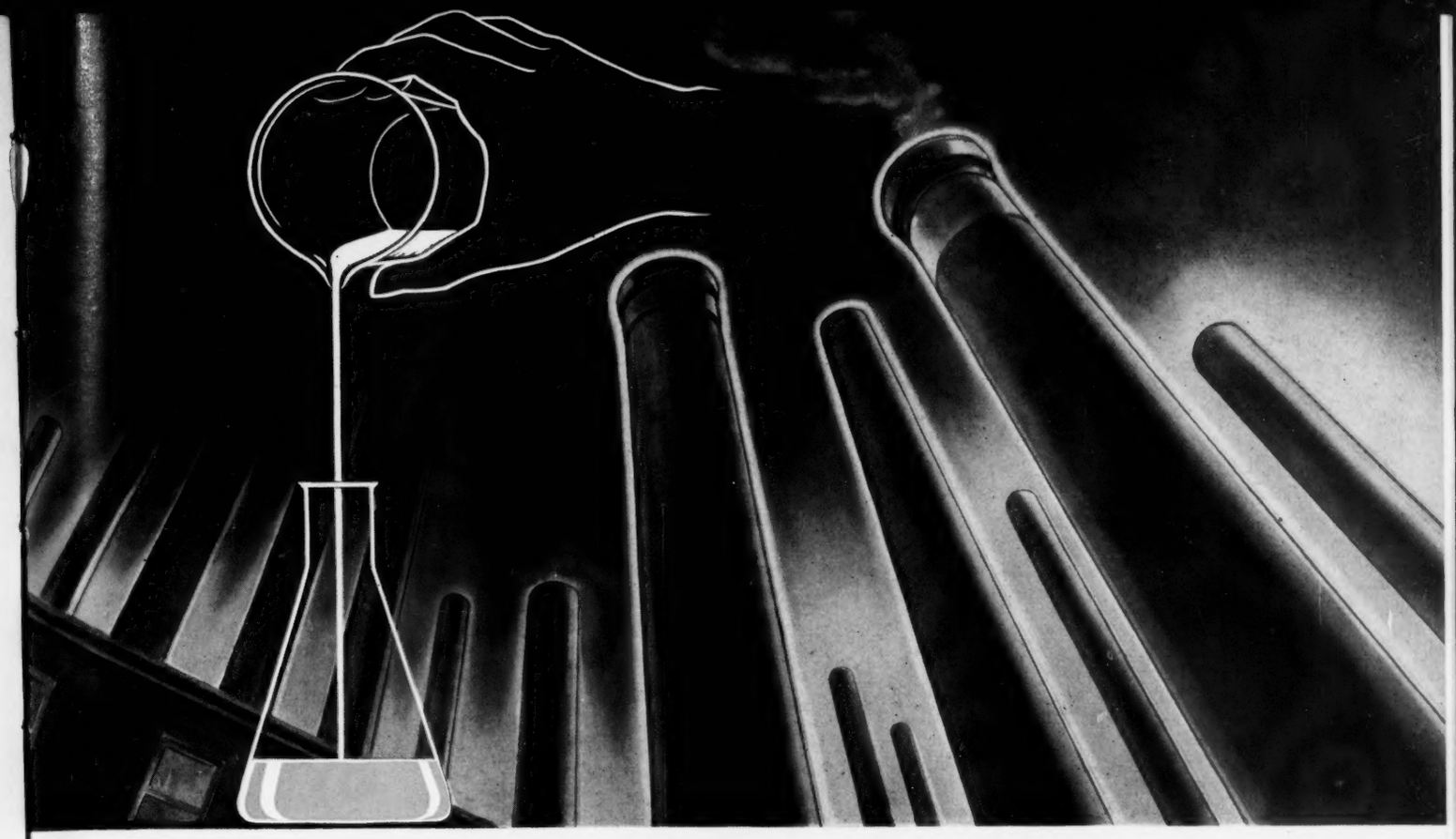
Recently announced by Dow, this revolutionary plastic pipe made of the thermoplastic resin known as Saran is now being manufactured in the same dimensions as extra strong steel pipe of 2″ OD or less. In welding, pieces are placed on a hot plate heated to 350°–400° F. and held until molten material appears. Pieces are then placed together in proper position—pressed firmly and allowed to cool for 10 seconds. The resistance of this pipe to extreme moisture, chemicals and solvents, coupled with its strength and fatigue life, indicate in many applications this new plastic pipe will undoubtedly replace strategic materials. The base resin is odorless, tasteless and nontoxic. The plastic does not burn and its toughness and abrasion resistance are of a high order. The retention of these properties on aging insures excellent wearing qualities. This pipe is nonscaling and withstands freezing. Heat resistance is said to be excellent up to 175° F. The pipe can be cut with a wood or hack-saw and threaded with ordinary iron pipe dies.





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It has been the privilege of the J. T. Baker Chemical Co. — in peace-time and now in war-time — to supply industry with tonnage chemicals of unusual purity.

We invite you to call upon Baker . . . and to rely upon Baker as a reliable source of supply. It may be that, in certain industries, some companies now making their own tonnage chemicals would like to free their plants of marginal operation.

Baker will gladly contribute the combined knowledge of its Technical, Executive and Manufacturing staffs to meet any war-time problem.

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Baker's

INDUSTRIAL CHEMICALS

CAUSTIC SODA

THE UNIVERSALLY USEFUL CHEMICAL

HOW OUR SOAP INDUSTRY DOES DUAL WARTIME SERVICE

Dow

SUPPLYING *cleansing agents* for our manpower—from war-plants to war-fronts . . . *Glycerine* for munitions industry—that's the job our soap manufacturers are doing. It's a dual service that is being performed with the help of Caustic Soda.

Today, soaps are manufactured principally by the process which makes glycerine recovery possible. To split the fat and remove the glycerine requires applications of Caustic Soda. For years this universally useful chemical has served the soap industry as the saponifier, a process material and a refining agent.

Dow supplies this vital industry with a substantial portion of its requirements as it does many other important industries in the country. Geographically located plants, large production capacity and uniform quality make The Dow Chemical Company a preferred source of supply.

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NEWS OF THE MONTH

GOVERNMENT

That Rubber Report, at Last

THE industry waited eagerly this month— as did this magazine, for it was near closing time—for the report of the President's special rubber investigating committee. Finally on Sept. 10th it was announced. In it were proposals for nation-wide rationing of gasoline and drastic restrictions on civilian operation of automobiles.

The committee had done its work well. President Roosevelt characterized the far-reaching report as "excellent" and ordered it to be put into effect as "rapidly as arrangements can be made." He said the government owed a debt of gratitude to the committee members Bernard M. Baruch, James B. Conant of Harvard, and Dr. Karl F. Compton of M. I. T.

It was a long step from that first committee meeting on a park bench in Washington to the submission of the voluminous document to the Chief Executive.

"We find the existing situation to be so dangerous," the committee told the President, "that unless corrective measures are taken immediately this country will face both a military and civilian collapse." They bluntly declared that there was no middle course in solving the nation's rubber problem, that it was "discomfort or defeat."

In addition to proposing that WPB Chief Donald Nelson appoint a national rubber administrator who would have "full responsibility and authority for all aspects of the rubber program," the committee suggested these additional steps:

(1) A national speed limit of 35 miles an hour for all passenger cars and trucks.

(2) A new gasoline rationing system based on an annual average mileage of 5,000 miles, compared with the present average mileage per car of 6,700 miles.

(3) Nationwide restrictions on gasoline and mileage.

(4) Compulsory periodic tire inspection.

(5) That more rubber be released to the public through recapping old tires, or the issuance of new ones, so as to maintain any necessary civilian driving.

(6) That a voluntary tire conservation program be put into effect pending establishment of gas rationing, which the committee said was "the only way of saving rubber."

The committee also recommended "a complete reorganization and consolidation of the government agencies concerned with the rubber program."

The report prepared at the request of Mr. Roosevelt, was sharply critical of government handling of the nation's rubber supply, saying that "consistency, cooperation between governmental agencies and adequate management have been lacking."

The committee recommended a substantial increase in the annual synthetic rubber production capacity, but said that there should be "no further substitutions" in the plans for synthetic processes already laid down.

"The limitation in the use of gasoline is not due to any shortage of that commodity," the committee said. "It is wholly a measure of rubber saving. That is why the restriction is to be nationwide. Any localized measure would be unfair and futile."

Seven-Point Program

The committee proposed a seven-point synthetic rubber program:

1. "That there be no further substitutions in the plans now laid down."

2. "The immediate authorization of an additional 140,000 tons of buna-S capacity per year," which would bring the total annual capacity up to 845,000 tons.

3. "The immediate institution of a refinery conversion program to yield a total of 100,000 tons of butadiene in addition to that now planned."

4. "The immediate adjustment in the rates of construction of present styrene and polymerization plants in order to obtain the maximum production of buna-S in 1943."

5. "The construction of an additional plant for the production of 20,000 tons of neoprene per year."

6. "The erection of a 27,000-ton butadiene plant from grain and an associated polymerization plant to produce 30,000 tons of buna-S both to be located near the center of grain production; the construction to be started six months hence."

7. "The immediate erection of alcohol plants to produce 100,000,000 gallons per year, using recently developed apparatus; the plants to be erected on sites near the grain-producing states and located on water transportation."

The committee said that tires on civilian cars are wearing down at a rate eight times greater than they are being replaced, and that if this rate continues in 1944 "there will be an all but complete collapse of the 27,000,000 passenger cars in America."

The committee voiced a note of restrained optimism in discussing its civilian restrictions, saying that if the synthetic program outlined in the report "will fulfill reasonable expectancy" the civilian restrictions might possibly be lessened somewhat before the end of 1943.

"But until then any relaxation is a service to the enemy."

Bemoans Errors

Saying that the country "is dependent, finally, upon the production of synthetic rubber," the committee bemoaned errors of the past "growing out of procrastinations, indecisions, conflict of authority, clashes of personalities, lack of understanding delays and early nonuse of known alcohol processes."

(See page 410 for more details)

Victor Chemical Gets Army-Navy "E" Award

August Kochs, president of Victor Chemical Works, Chicago, accepts the Army-Navy "E" award for excellence in war productions at ceremonies held Sept. 1 at the company's plant in Mt. Pleasant, Tenn.

GENERAL

Show Twice Former Size

An important contribution of the chemical industry to the war-time effort, the National Chemical Exposition will be held Nov. 24 to 29 at the Hotel Sherman in Chicago.

Added importance will be given the show, second to be sponsored by the Chicago Section of the American Chemical Society, because of the conference to be held in conjunction to be addressed by leaders of the industry, educators and other authorities. The program is now being arranged by the conference committee.

Victor Conquest, director of research for Armour & Co., who is chairman of the show committee, anticipates an attendance of approximately 20,000 from all sections of the country including research chemists, executives of industrial plants, engineers, purchasing agents, government specialists and others who will be afforded the opportunity of making valuable contacts at the show and conference.

He announces that the transfer of the show from the Stevens Hotel to the Hotel Sherman will be a boon for the exposition, providing adequate space for the display of commercial and educational exhibits and also a location within the loop, accessible to the retail and amusement center.

The shift in location was due to the acquisition by the War Department of the Stevens Hotel, which has become a training school for Army purposes.

"This year's show will be twice as large in the number of exhibits and floor space as the first exposition held by the Chicago Section in 1940," said Mr. Conquest.

Information regarding space for exhibits may be obtained by writing Marcus W. Hinson, manager of the exposition, National Chemical Exposition, 110 North Franklin Street, Chicago.

New Plastics Committee

Formation of the Organic Plastics & Resins Manufacturers Industry Advisory Committee was announced last month.

Arthur E. Petersen, Chief of the Organic Plastics and Resins Section, Chemicals Branch, has been appointed Government Presiding Officer.

Urges Salvage Help

W. S. Carpenter, Jr., president of E. I. du Pont de Nemours & Company, Inc., participating in the work of the American Industries Salvage Committee to enlist the full cooperation of individual industrial concerns behind the current scrap salvage program of the War Production Board has written to companies in the industry urging full and complete cooperation with the program of the Industrial Salvage Section of WPB. He has also asked that each company appoint a responsible official to assist in any way possible the local general Salvage Committees that have been established by WPB in 12,000 communities.

Metallurgists Wanted

The U. S. Civil Service Commission is recruiting Junior Metallurgists under a new announcement for which the qualifications are: (1) completion of a four-year college course in metallurgy or metallurgical engineering, or (2) completion of a 4-year course in chemistry, geology, physics, or engineering, *supplemented* by (a) one year of paid experience in metallurgy (college teaching in metallurgy is acceptable), or (b) 15 semester hours in metallurgy or metallurgical engineering, or (c) completion of two war training courses in metallurgy.

Announcements and application forms may be obtained at any first- or second-class post office or from the Civil Service Commission, Washington, D. C.

Manpower Conference

War Manpower Commission is meeting with industrial managers to outline the program it has developed to meet the manpower problem at a conference of the American Management Association at the Hotel Pennsylvania, N. Y. City, Sept. 29 and 30. Conference has been planned under direction of L. A. Appley, vice-president of Vick Chemical Co.

New "Poly" Courses

Department of Chemistry of the Polytechnic Institute of Brooklyn has scheduled series of seminars on "The Mechanism of High Polymeric Reactions," which are scheduled to be held every other Saturday from 11:00 a. m. to 1:00 p. m., in Room 30, 85 Livingston Street, Brooklyn, N. Y. beginning Oct. 3rd.

Seminars will be under the direction of Professors H. Mark and C. E. Waring.

Polytechnic Institute of Brooklyn is to offer in the fall of 1942-1943 a course in the reading of Chemical Russian. This course will be given on Tuesday evenings throughout the year. It is designed to give a mastery of the grammatical principles and the vocabulary necessary for the translation of technical articles from Russian reference books and periodicals. Registrants need not have had previous experience with Russian but must have studied some other modern foreign language.

Details may be had by writing Professor Raymond E. Kirk of the Department of Chemistry, 99 Livingston Street, Brooklyn, N. Y.

New Columbia Courses

Training in metallographic laboratory practice will be given for women in an intensive, tuition-free course at Columbia University in cooperation with the United States Office of Education.

Women with some academic training in chemistry and physics, or equivalent experience in these fields are eligible for the course, which will start Sept. 14, and will be held two evenings a week from 7 to 10 p. m. for three months.

An intensive course in the production and testing of powder and explosives is planned by Engineering, Science, and Management War Training at Columbia University, subject to approval of the U. S. Office of Education and adequate number of qualified applicants. Tuition is free.

Three years of college chemistry and U. S. citizenship are required. Interviews will be given Sept. 28, 29 and 30 from 7 to 9 p. m. in Room 309, Havemeyer, Columbia University.

Course begins Oct. 5, Monday, Wednesday and Thursday, 6:30 to 10:30 p. m. for 12 academic weeks. Further information may be had at Room 313, Engineering Building, Columbia.

Col. Kuhn Marries

Colonel Harry A. Kuhn, Commanding Officer of the New York Chemical Warfare Procurement District, and Mrs. Sara Louise Hoeffer Kistler, connected with the New York office of Mathieson Alkali, were married at Riverside Church in N. Y. City, Aug. 22.

The bride is a graduate of Shipley School, Bryn Mawr and Bryn Mawr College. Col. Kuhn has had long experience in the chemical field having served with the CWS almost since its inception 25 years ago. In 1932 he was assigned to head the Chicago Chemical Warfare Procurement District and since 1938 has been Commanding Officer of the New York District.

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COMPANIES

New Munitions Plant

A large munitions plant in Morris County, N. J., will be opened soon by Metals Disintegrating Co. of Union. Chemical Warfare Service is withholding details of location, size and employment. Plant will be operated under government contract and will ease pressure on Picatinny Arsenal.

Get Army-Navy "E"s

H. K. Porter Co., Pittsburgh, was one of the first Western Pennsylvania manufacturers and also among the first 35 manufacturers in the country selected by the Army and Navy Departments to receive the joint Army-Navy "E" Award, in recognition of high achievement in the production of war equipment.

S. F. Bowser & Co., Inc., Fort Wayne, Ind., and subsidiary, Fostoria Screw Co., Fostoria, O., were recently accorded the joint Army-Navy "E" Production Award.

Ferro Acquires Lawson

Ferro Enamel Corp. has taken over W. B. Lawson, Inc., Cleveland, O.

W. B. Lawson, Inc. will continue to be conducted under Mr. Lawson's direction. Plans for expanding the distributorships to include other well known products are in process. At this time W. B. Lawson, Inc. is the sole sales agent for Ferro Drier & Chemical Co., and national sales agent for sodium silico fluoride produced by Tennessee Corp.

Two Give Back Wages

Two chemical concerns, one in Brooklyn, N. Y. and one in N. Y. City, have agreed to make voluntary restitution of back wages and overtime due their employees under the Fair Labor Standards Act, it was announced by Arthur J. White, Regional Director of the Wage and Hour Division, U. S. Department of Labor.

The firms are: M. Schneider & Sons, 114 Greenpoint Av., Brooklyn, N. Y.; Etchall, Inc., 109 Prince St., N. Y. City.

Taussig Moves

F. S. Taussig, distributor of heavy chemicals and representative of chemical works, transferred offices early this month from 203 West 74th St., to 175 West 76th St., N. Y. City.

Michigan Alkali Moves

General sales offices of the Michigan Alkali Co. are now located in Wyandotte, Mich. The previous location was in the Ford Building, Detroit. New telephone number is Wyandotte 1700. The new mail address is Post Office Drawer 472, Wyandotte.

Faber Moves

Faber Laboratories, Inc., moved office and laboratory recently to larger quarters at 1025 Georgia St., Los Angeles, Calif.

Increase Guayule Capacity

Increasing demand for guayule rubber now widely used for compounding with synthetic rubbers has led to doubling the productive capacity of Cia Hulera de Parras, important producer of guayule according to an announcement made last month by American Cyanamid & Chemical Corp., representative of the Mexican company. Increased capacity, with the cooperation of U. S. government agencies is expected to be completed early in October.

Helium in "Priorities"

Helium is the subject discussed in the September number of "Priorities," house magazine of Prior Chemical Corp.

Columbia Alkali Moves

Executive sales office of the Columbia Chemical Division of the Pittsburgh Plate Glass Co. has been moved to Pittsburgh from New York. Also involved in the transfer are the chemical division's traffic and advertising departments.

W. I. Galliher, director of sales of the chemical division, will be in charge of sales activities from the new headquarters.

Get Maritime "M"

Rear Admiral Emory S. Land, chairman of the U. S. Maritime Commission, also administrator of the U. S. War Shipping Administration, awarded this month the Maritime Commission "M" burgee to the Barberton Works of Babcock & Wilcox Co., 85 Liberty Street, N. Y. City. The award represents the Commission's recognition of outstanding achievement.

The "M" burgee now flies alongside the Navy "E" burgee, which was awarded to Babcock & Wilcox May 11.

Salvage Campaign Fruitful

The salvage campaign at the plants of Merck & Co. Inc., at Rahway, N. J., Philadelphia, Pa., and Elkton, Va., has returned 640,292 pounds of scrap iron and 5,199 pounds of scrap rubber, together with substantial quantities of other strategic materials such as copper, aluminum, and brass, according to the company.

ASSOCIATIONS

Ceramic Society to Meet

White wares and materials and equipment divisions of the American Ceramic Society will meet for their autumn session Sept. 18 and 19 at Pennsylvania State College, State College, Pa.

Refractories division autumn meeting was held at the Dearborn Inn, Dearborn, Mich., Aug. 28 and 29.

Textile Committee

American Association of Textile Chemists and Colorists in its program of cooperation with the government in the defense and war programs, recently organized a committee to study the problem "Ageing of Sulfur Dyed Textiles."

Salesmen Play Golf

Salesmen's Association of the American Chemical Industry held its 3d golf tournament of the season last month and came up with the following prize-winners:

Members Low Gross A, Paul Dunkel; Members Low Gross B, Leon Miller; Members Low Gross C, T. A. Cassidy; Members Low Net A, C. W. French; Members Low Net B, N. H. Fyffe; Members Low Net C, P. J. LoBue; Members Kickers, R. Boland; Members Kickers, J. Eldridge; Members Kickers, R. L. Hutchins; Members High Gross, W. B. Mullen; Guests Low Gross, J. J. Rusk; Guests Low Net, R. H. McCahan; Guests Kickers, H. Erickson, American Water Works & Electric Company; Winner of $25.00 Defense Bond, J. J. Rusk; Winner Set of Golf Woods, Paul Miller.

Tappi to Meet in Boston

Fall meeting of the Technical Association of the Pulp and Paper Industry will be held Sept. 29 to Oct. 1 at the Statler Hotel, Boston, Mass.

In addition to many Institute of Paper Chemistry papers to be presented at the convention, the following sessions are scheduled: Wartime Packaging, Paper Industry in War, War Production Board and the Industry, Mill Organization in Wartime, Engineering and the War, Wood Pulp Industry Wartime Projects, Water Conservation and Tub Sizing.

An exhibit showing the progress being made by various industries in substituting containers made in whole or part of paper or paperboard for materials essential to the war effort is an additional feature of this year's convention. Information on this exhibit may be obtained from the association's secretary, R. G. Macdonald, at 122 East 42d St., N. Y. City.

Distribution Conference

Fourteenth annual Boston Conference on Distribution will be held at the Hotel Statler, Oct. 5 and 6. Main themes of this national forum on problems of distribution will be "Distribution's Part in Winning the War," "Post War Adjustment of Business" and "Major Trends in Distribution."

THE GREEN GODDESS

Chlorine has been aptly termed the Green Goddess. Penn Salt is glad to have an important part in making her services available for our war effort.

But she is essentially a peace goddess, for in thirty-odd years of purifying public water supplies, chlorine has performed a humanitarian service in public health protection.

And, as a bleaching agent widely used in the paper industry; for organic synthesis, and many other chemical manufacturing processes, it has definitely earned Industry's appreciation.

Penn Salt takes particular pride in the fact that, in 1909, its Wyandotte, Michigan, works shipped the first tank car of liquid chlorine in the Western hemisphere. And now, as then, Penn Salt is exploring new possibilities for chemical service.

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CHEMISTRY
IS THE KEYSTONE
OF INDUSTRY

Fourteen distinguished speakers from all walks of business and industry and government are on the program in addition to a panel discussion by notable business magazine editors.

Glass Meeting Set

Fall meeting of the glass division, American Ceramic Society, is being held at the Seaview Country Club, Absecon, N. J., Sept. 18, 19 and 20.

Technical program includes the following: 1 "Replacement of Natural Gas by Oil Fuel" by E. S. Hammond, Bloomfield, N. J. 2. "Replacement of Natural Gas by Oil Fuel" by Gerald FitzGerald, Maxon Premix Burner Company, New York. 3. "Conversion of Oil Fired Furnaces to Producer Gas Firing." 4. "Fuel Technology." 5. "Chemical Analysis of Cords and Stones in Glass" by George Zarbo, Herbert J. Hunt, and D. C. Smith, Kimble Glass Company, Vineland, N. J. 6. "Glass in War Time" (A film of glass during the war in England) by Robert A. Miller, Pittsburgh Plate Glass Company, Pittsburgh, Pa.

Paint Technicians Meet

Technical advisory committee of the Federation of Paint and Varnish Production Clubs met at the Chemists' Club, N. Y. City, Aug. 18. Coatings for the inside of portable water tanks were discussed and the engineer board advised that an approved list for compliance with specification No. 1279 will be set up.

New York Production Club subcommittee is preparing a paper on a fundamental study of the oleoresinous emulsifiable paints, it was announced. This will be released later this year.

A.C.C. & C.E. Offers Booklet

In a recently-published booklet designed to tell "What A.C.C. & C.E. Offers You," the Association of Consulting Chemists and Chemical Engineers, Inc., 50 East 41st St., N. Y. City, outlines its services offered without charge.

Upon request, the association will give the names of consulting chemists and chemical engineers—located from coast to coast—specially qualified for any particular problem. Also offered is a copy of the current "Classified Directory" descriptive of the members' activities.

To Discuss Health

Using as its theme "Health Arms the War Workers," the Seventh Annual Meeting of the Industrial Hygiene Foundation will be held at Mellon Institute, Pittsburgh, Nov. 10 and 11. The meeting of foundation members, most of them companies producing war materials, will be shown how measures for cutting our manpower waste shortage in face of a threatened labor shortage will be taken.

Safety Congress to Meet

The theme of the 31st National Safety Congress and Exposition, to be held in Chicago October 27-29, the National Safety Council announced is "Save manpower for warpower!"

The first wartime Congress since 1918 will be devoted completely, the Council said, to the safety job now at hand—to help win the war.

The entire Congress program, covering every phase of safety with 175 sessions and 500 program participants, will be centered on the problem of stopping accidents that delay victory by slowing production, impeding the movement of troops and supplies, and wasting manpower, materiel and time.

Junior Ch.E's Meet

First fall meeting of the Junior Chemimal Engineers of New York, scheduled for September 24, will feature as the speaker Richardson K. Wood, former general manager of *Fortune* magazine, originator of Fortune Survey of Public Opinion, and widely-known speaker on chemical trends. Mr. Wood will discuss war-stimulated developments in the chemical field and the influence these will probably have on the postwar world. The meeting will be held at Childs Restaurant, 109 West 42d Street, New York, and dinner will be served at 7:00 P. M. All interested persons are invited to attend.

Newly elected officers and committee chairmen for the organization are as follows: President, John R. Callaham, Chem. and Met. Eng.; Vice-President, Howard Ten Broeck, Socony-Vacuum Oil Co.; Secretary-Treasurer, Alvin S. Weiss, Schenley Distillers Corp.; Asst. Sec.-Treas., Edward T. Maples, M. W. Kellogg Co.; Publicity, George M. Hain, Joseph Dixon Crucible Co.; Program, Raymond P. Devoluy, U. S. Navy Materials Lab.; Membehship, Frank Melaccio; Intersociety Activities, Frank B. White, Foster Wheeler Corp.

Victory Banquet Set

A gala "Victory Banquet" whose entire proceeds are to go to Army and Navy relief, American Red Cross and U. S. O., will be held under the auspices of the National Wholesale Druggists Association on the occasion of its 68th annual convention, Sept. 29th at the Hotel Waldorf-Astoria, N. Y. City. Percy C. Magnus, president, Magnus, Mabee & Reynard, Inc., is chairman of the affair.

The dinner, which is formal, begins at 8 p. m. Cost per cover is $10, including taxes. Entertainment will be provided.

This "Victory Banquet" marks the first time an NWDA banquet has been opened to any but members. Ladies will be present.

DCAT Holds Luncheon

First Fall luncheon meeting of the Drug, Chemical and Allied Trades Section of the New York Board of Trade was held Sept. 10 at the Hotel Pennsylvania, N. Y. City. Because of a change in the War Production Board involving the transfer of the "drug work" to the Chemical Branch, Francis M. Shields, chief, Health Supplies Branch, who was the scheduled guest speaker, was not present.

Fred J. Stock, in charge of the activities of the newly-formed Drug Branch, was at the meeting as principal speaker to outline the work of his department. He explained that Mr. Shields was taking up other duties with the WPB. Further, he stated, the realignment will involve the divorcement of metals from the Chemical Division.

Turner Currens, in charge of proprietaries and biologicals for the branch, also spoke.

The Section's annual meeting at Skytop, Pa., has been cancelled in compliance with the government's request that the burden on railroads and travel be lightened wherever possible.

PERSONNEL

Robert L. Warfel has been named a research engineer on the staff of Battelle Memorial Institute, Columbus, O., and has been assigned to the division of analytical chemistry.

Edward C. Feddern has been transferred from the general laboratories of W. H. and L. D. Betz, Philadelphia, to the department of research. He will devote the major portion of his time to the study of scale prevention and sludge fluidity in connection with cooling waters.

Ralph E. Davis, Jr., has joined the sales department of the Hooker Electrochemical Co., Niagara Falls, N. Y. He was superintendent of the tannery of Maylender Bros., glove and garment leather manufacturers, Johnstown, N. Y. for the past six years and previously was superintendent of the tannery of Martin Littell Leather Corp., Gloversville, N. Y.

H. V. Fairbanks has been appointed assistant professor of chemical engineering at Rose Polytechnic Institute, Terre Haute, Ind.

A. Brothman and **A. P. Weber,** formerly of the engineering department of the Hendrick Manufacturing Co., have affiliated themselves with the

VICTORY BANQUET

Under The Auspices of **N.W.D.A.** 68th Annual Convention

A STAR-SPANGLED EVENT FOR THE BENEFIT OF ARMY & NAVY RELIEF ★ U. S. O. ★ RED CROSS

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Send Reservations to* PERCY C. MAGNUS, *Victory Banquet Chairman,

★ ★ ★ ***16 Desbrosses St., N.Y.C.*** ★ ★ ★

Chemurgy Design Corp., a division of the Golwynne Chemicals Corp., N. Y. City. They will supervise the engineering-contracting division as well as the process equipment consulting design activities of the corporation. Brothman has joined in the capacity of chief engineer and vice-president and Weber as secretary and assistant to the president.

Robert S. Aries, formerly associated with a research project of the Northwood Chemical Co. at Polytechnic Institute of Brooklyn, has accepted the position of research engineer on the technical staff of Connecticut Hard Rubber Co., New Haven. He has been assigned to the division of plastic research.

Aries is the author of last month's feature article in CI entitled "Chemical Utilization of Wood Waste." His research at Brooklyn Poly was in the fields of cellulose and lignin. He was also on the faculty of the department of economics at the school.

F. C. Todd, formerly a member of the faculty of Pennsylvania State College, has joined the technical staff of Battelle Memorial Institute, Columbus, O., and has been assigned to research in industrial physics.

Dr. Frederick W. Sullivan, Jr., has been appointed technical director of the Institute of Gas Technology, Chicago. He comes to the Gas Institute from the Barrett Division of Allied Chemical and Dye Corp., where he has been manager of chemical research since 1940.

R. A. Schoenfeld, vice-president and sales manager for Wheelco Instruments Co., Chicago, has announced three appointments to the company's sales and service organization. **C. L. Clark,** of Westinghouse Electric & Manufacturing Co. for the past 13 years—recently as control specialist at the Cincinnati office—has been attached to the Cleveland office as sales engineer. **Robert N. Miller,** for the past seven years sales and service engineer for Mercoid Corp., in Chicago, is now service engineer with the Wheelco Cleveland office. **Howard B. Jones,** formerly with McGraw-Hill Publishing Co., has been employed as sales and service engineer at the Chicago office.

Dr. J. Mitchell Fain has been granted a leave of absence for the duration from his duties as chemical engineer at Foster D. Snell, Inc., Brooklyn, N. Y. Major Fain has been called to active duty in the Chemical Warfare Service and is now stationed at the Chemical Warfare School, Edgewood Arsenal, Maryland.

Professor Henry Eyring of Princeton University will join the staff of the department of chemistry, Polytechnic Institute of Brooklyn, for the coming academic year as Visiting Professor of Physical Chemistry.

Raymond J. Carey, technical salesman for General Dyestuff Corp., has been granted a leave of absence to accept a commission in the Chemical Warfare Service as first lieutenant.

Herbert D. Schmidt, formerly New England Representative of the American Hard Rubber Co., has just become affiliated with the sales department of United States Stoneware Co. He will make his headquarters in the New York office.

E. W. Ritter, recently appointed assistant to the president of Corning Glass Works, has been called to Washington for work in connection with the U. S. Signal Corps. Mr. Ritter, who, before coming to Corning, was vice-president of R.C.A., has had extensive experience in engineering, manufacturing, and research, related to communication problems. He expects his special assignment will require about three months of his time, after which he will return to his duties at Corning.

George Cushman, chief, Fertilizers and Insecticides Branch, O P A, resigned Sept. 1 and returned to his former position as operating head of Long Island Produce & Fertilizer Co., Inc., Riverhead. Pending selection of a successor, **Cedric Gran** has been made acting chief.

Anthony Anable, member of the Dorr Co.'s staff since 1923 and advertising and publicity manager since 1932, has been commissioned Lieutenant Commander in the U. S. Naval Reserve and left Aug. 14 for active duty in an administrative capacity at the U. S. N. R. Midshipmen's School in New York. Commander Anable served as an Ensign in the Naval Reserve from 1917 to 1919. For the present, his duties as advertising manager will be carried on by his assistant, **Albert Morris,** a member of the department for the past five years.

Richard C. Hedke, vice-president and managing director of Eaton-Clark Co., Detroit, chemical and dyestuff distributors—was given a testimonial dinner at the Detroit Yacht Club, Aug. 27, on the occasion of his 35th anniversary with the company. Office and factory employees attended the dinner, including department heads, and Rufus W. Clark, chairman of the board.

Elmer W. Silvers, secretary of Whitehead Metal Products Co., Inc., was elected treasurer of the company recently, succeeding the late **William L. Rianhard** who died July 24. He continues as secretary. Last month, CI inadvertently elected Mr. Silvers treasurer of International Nickel.

Elected Director

At a meeting of the board of directors of the Pennsylvania Salt Manufacturing Co. Francis Boyer was elected a director to fill the vacancy resulting from the death of Samuel D. Warriner on April 3. Mr. Boyer is Executive vice president and director of the Smith, Kline & French Laboratories, Phila.

OBITUARIES

Dr. H. C. Miller

Dr. Henry C. Miller, for many years a well-known chemist and Washington representative for trade associations in the field, died suddenly at New Haven, Conn., Aug. 26, while en route to Washington. He was 63.

Dr. W. E. Weiss

Dr. William E. Weiss, former chairman and general manager of Sterling Products, Inc., N. Y. City, died in a hospital at Petoskey, Mich., Sept. 3 of injuries received in an automobile collision. He was 63.

T. S. Grasselli

Thomas S. Grasselli, 67, long a prominent figure in the chemical industry and president of Grasselli Chemical Co. from 1916 until its merger with du Pont in 1936, died at his home in Cleveland, Aug. 22.

Jacob F. Schoellkopf, Sr.

Jacob F. Schoellkopf, Sr., a pioneer in the aniline color industry and founder of the famous Schoellkopf Gold Medal Award for major advances in chemistry, died Sept. 9 at his home in Derby, N. Y. His age was 84.

Dr. John A. Wilson

Dr. John A. Wilson, consulting chemist, died Sept. 9 in Doctors Hospital, N. Y. City, after an illness of six months. He was 52.

CHEMICAL SPECIALTY COMPANY NEWS

To Expand Rare Chemicals

PLANS for greatly expanding production of specialized drugs and pharmaceuticals for sale to ethical houses are being put into effect immediately at the newly-acquired Rare Chemicals, Inc., plant at Flemington, N. J., it has been announced by the National Oil Products Company.

The seven and one-half acre Flemington plant was acquired recently by National Oil Products in the first sale by the Alien Custodian's Office of any of the properties that have been seized from foreign nationals. It will be operated as a wholly owned subsidiary and will have its own board of directors and officers.

Expanded production of the chemicals and other products formerly manufactured by Rare Chemicals as rapidly as circumstances will permit is expected.

A stepped-up research program also is being instituted. Among the products now being manufactured at the Flemington plant are anesthetics, hormones and analgesics for ethical distribution.

Officers of the new subsidiary company are Charles P. Gulick, president; Erwin T. Fritzsching, vice president; Ralph Wechsler, treasurer, and A. A. Vettor, secretary. Mr. Fritzsching, who formerly was president of Rare Chemicals, Inc., will remain with the reorganized company as manager.

Add Hog Bristle Business

Devoe & Raynolds Company, Inc., paint and brush manufacturers, are now dressing domestic hog bristle for use in making brushes.

Heretofore, all hog bristle used in the manufacture of brushes in this country was imported from the Far East, particularly China and Siberia. In 1941 approximately 6,000,000 pounds of dressed bristles were imported. Now, due to the conflict in the Pacific, imports of this vital raw material have been cut off, with the result that the national stockpile of bristle has been greatly depleted.

Progress made in the use of domestic hog bristle for brushes follows many months of research, experimentation and cooperative work between large packers and Devoe & Raynolds. The company has outlined a plan to and is cooperating with the Department of Agriculture in the latter's effort to gather hog bristle through county collection agents, officials of 4-H Clubs and others who can assist in this work.

As evidence of the need for bristle in the manufacture of uniforms and blankets for our fighting forces, the War Production Board placed bristle for the carding of wool at the top of the priority list. In addition, bristle for military purposes finds its way into hair brushes, clothes brushes, horse brushes and brushes for sterilizers, beekers and other cleaning purposes.

Paint is brushed on tanks, aeroplanes and cantonments. Brushes are used extensively for applying camouflage. Industrial plants, making war materials, require brushes in sizable quantities for painting and maintenance. Food manufacturers, bakeries, flour mills, cereal mills and others require use of floor sweeping brushes.

Heydt Heads Athletics

Elmer F. Heydt, 24, of 60 Garrison St., Newark, N. J., was elected president of the Nopco Athletic Association for 1942-43 at the annual election of officers held at the National Oil Products Company plant in Harrison, N. J. He succeeds Robert Wetherhold.

Heydt is employed in the Vitamin Special Markets Production Division. He has been with the company for the past five years.

Other officers elected included Mary O'Connell, vice president; Helen Ellor, secretary, and Charlotte Hope Fey, treasurer.

In addition, nine members were elected to the Board of Governors of the Association. They are Charles Moran, Philip Mistretta, Carl Swanson, William Nothum, Ralph Rogers, Betty Schlegel, Lillian Abbott, Dorothy Erb and Mrs. Alberta Pickell.

The Association issues a periodical, entitled "Nopco News," of which Frank Pickell is editor. Mary O'Connell and Pat Greene are associate editors, with Alan Cowley and Alice Miller assisting.

Gulick Asks Sacrifices

Calling for "all out" sacrifices to match the Axis' "total war" effort, Charles P. Gulick, president and chairman of the board, National Oil Products Company, Harrison, N. J., in his monthly "communique-to-employees," warned that Americans dare do no less "than muster every man, woman, machine, farm and dollar to the job of smashing the enemy."

Pointing out that we have everything to lose, Mr. Gulick contended that we in America must think in terms of "total war," too.

New Label Design for Merkin Industrial Finishes

An attractive new label for five gallon pails and one gallon cans in the industrial finish line is announced by M. J. Merkin Paint Co., Inc., N. Y. City. The one gallon can has a complete wrap-around label. The five gallon pail bears a label on the front half. These are printed in copper and black. There is a dark green enamel finish on the pails.

Wartime Research Theme of ACS Meeting

More Than 4,000 Chemists and Industrialists Attend Sessions of American Chemical Society's 104th Meeting at Buffalo; Hear 400 Papers on War Work

The wartime research of America's chemists in the vital fields of synthetic rubber, petroleum, new uses of coal, and the preservation of food for the armed forces and civilians were features of the 104th meeting of the American Chemical Society at Buffalo, N. Y., Sept. 6-11.

More than 4,000 chemists and industrialists attended sessions of 18 professional divisions of the Society to hear 400 scientific papers detailing results of the war work of chemists from leading universities and industry's laboratories.

New developments in synthetic rubber research were described at 2 p. m. Wednesday at a general meeting of the Society. Dr. Edward R. Weidlein, director of the Mellon Institute of Industrial Research and technical consultant on rubber of the Reconstruction Finance Corporation, discussed "Progress of Synthetic Rubber Production"; Albert L. Elder, of the War Production Board, outlined "Progress of Butadiene Production," and Willard H. Dow, president of the Dow Chemical Company, reported on "Progress of Styrene Production." A general discussion of "The Outlook on the Rubber Situation" followed.

Petroleum research was reported at a session of the Petroleum Division Thursday. The role played by coal in making synthetic rubber, plastics, cement and chemical intermediates, and other urgently needed war products was discussed at a symposium on "Uses of Coal by Various Industries," Thursday morning and afternoon.

Representatives of the government joined with food authorities from all parts of the country in a symposium on "Methods for the Preservation of Foodstuffs and Their Application in the War Effort," held Monday afternoon and Wednesday morning.

Other sessions of the five-day meeting heard research reports on cellulose, colloids, fertilizer, paint, varnish and plastics, gas and fuel, water, sewage and sanitation, industry and engineering, medicine, biological and organic chemistry, physical and inorganic chemistry, analytical and micro chemistry, and chemical education.

Keynote address of the meeting was given by Dr. Harry N. Holmes, president of the Society, who discussed "National Survival Through Science," at the opening public session at 8:30 p. m., Monday, at Kleinhans Music Hall. Dr. Charles M. A. Stine, vice president of E. I. du Pont de Nemours and Company, spoke on "Molders of a Better Destiny."

At Wednesday's general meeting Dr. Florence B. Seibert, of the Henry Phipps Institute of the University of Pennsylvania, received the Francis P. Garvan Gold Medal, honoring women in chemistry, for her "distinguished work on the chemistry of tuberculosis." For contributions in the field of protein chemistry, Dr. John Lawrence Oncley, 32, associate in physical chemistry at the Harvard Medical School, received the $1,000 American Chemical Society Prize in Pure Chemistry given annually for outstanding research in pure chemistry by a man or woman less than 36 years old.

A symposium on "Potash," vitally important plant food, was held all day Tuesday under the auspices of the Division of Fertilizer Chemistry.

Dr. Harry L. Fisher, formerly of the U. S. Rubber Company, and now director of organic research of the U. S. Industrial Chemicals, Inc., Baltimore, discussed synthetic rubber with particular reference to coal as an actual and potential source of raw materials.

Reports on the "Protection of Foodstuffs Against War Gases," by Dr. Sidney H. Katz, United States Chemical Warfare Service, Edgewood Arsenal, Md., and on "Food Packaging for Overseas Use," by Captain Robert R. Melson, Quartermaster Corps, Subsistence Research Laboratory, Chicago, were presented at the symposium on "Methods for the Preservation of Foodstuffs and Their Application in the War Effort," on Wednesday morning.

"Food Requirements for Overseas Use," was the theme of a report by Captain Virgil O. Wodicka, Quartermaster Corps, Subsistence Research Laboratory.

Dr. J. K. Roberts, director of research of the Standard Oil Company of Indiana, presided at Thursday's session of the Petroleum Division.

A new method of extracting vanadium, vital war metal was reported by Dr. J. Perry Morgan, chemical engineer of the Standard Oil Company, and Dr. Arthur W. Hixson, professor of chemical engineering of Columbia University, Monday afternoon at a meeting of the Division of Industrial and Engineering Chemistry. Drs. Donald F. Othmer and Robert L. Ratcliffe Jr., of Polytechnic Institute, Brooklyn, outlined a new procedure for the recovery of alcohol for butadiene and rubber from heretofore waste dilute liquors.

Fifty papers were presented at the sessions of the Division of Organic Chemistry of which Dr. Lee I. Smith, University of Minnesota, is chairman. Reports of investigations covering a broad variety of chemical structures, ranging from shellac to coffee beans, were presented.

The October issue of CHEMICAL INDUSTRIES will feature a complete report on this epic-making meeting by Walter J. Murphy, editor. In addition, several roto pages of pictures of personalities taken at the meeting will be included.

Honored by American Chemical Society

Dr. John L. Oncley, 32, (left) associate in physical chemistry at the Harvard Medical School, and Dr. Florence B. Seibert, (right) of the Henry Phipps Institute, University of Pennsylvania, were honored at the 104th meeting of the American Chemical Society in Buffalo. Dr. Oncley received the $1,000 ACS prize in pure chemistry for 1942. Dr. Seibert was cited for "distinguished work on the chemistry of tuberculosis."

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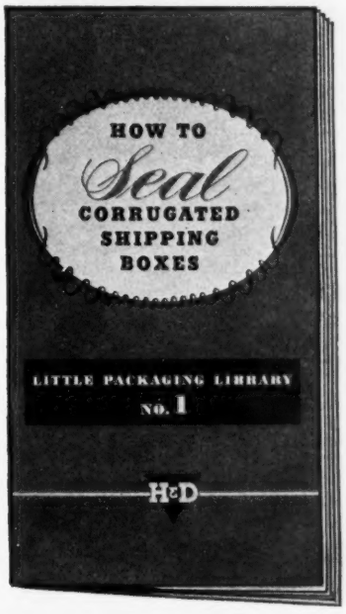

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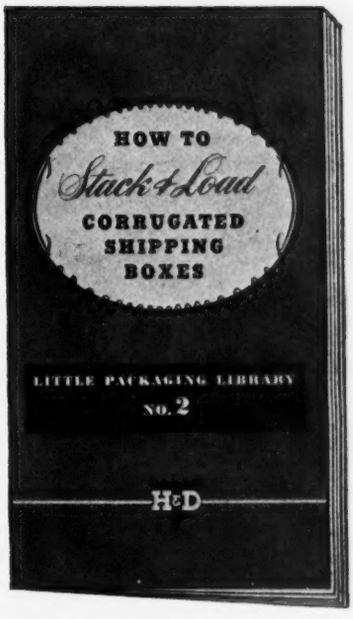

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FOREIGN LITERATURE DIGEST

By T. E. R. Singer

BOLETIN DE MINAS Y PETROLEO (Mexico) Vol. XIII, No. 5, 1942, p. 105-111.

CIRCULATING MUD IN THE DRILLING OF OIL WELLS: A report by Jose Jodriguez Cabo, Jr., goes into considerable detail on the application of muds in oil well drilling. Most of the petroleum deposits in Mexico are contained in rocks which belong to the Cretaceous period of the Mesozoic era and of the tertiary Cenozoic era. They can also probably be found in still older formations.

It is absolutely necessary to use all the modern technical procedures known to the petroleum industry in order to obtain this product at the lowest possible cost and without wasting the reserve supply.

The use of circulating mud in drilling the oil wells is a very important factor in successfully reaching the depths of the layers in which the oil occurs, avoiding the incalculable dispersion of the gas which is one of the primary forces propelling the petroleum. It also prevents the caving in of the walls of the well in formations that are not very solid, and considerably decreases the expenditures of the various drilling operations.

The circulating mud used in the camp of Poza Rica, in the state of Veracruz, which is the third largest in the world in capacity (from 2,000 to 4,000 million barrels), has to have certain specific properties so as to be able to withstand the enormous pressures of 1,500 to 2,000 lbs. per sq. in. of the gas at the bottom of the pipe and at depths that exceed 2,000 meters.

The circulating mud consists of a mixture of chemically pure water and treated clay or similar material, of determined degrees of consistency suitable to the particular conditions under which it will be used.

The fluidity of the mud can be increased or decreased by adding cement or certain chemical materials. The addition of a small quantity of cement increases the viscosity and decreases the time of settling.

Hydraulic lime is used to produce coagulation or to increase this property in the mud, but it also produces an inferior mud and is no longer used in drilling. Sawdust, hay, lime, cement, etc. are also used to increase the viscosity of the mud in order to re-establish the suspended circulation, prevent the caving in of the walls of the oil wells and to mould formations that are not very solid.

The properties of the mud are of great importance and must be studied with care. The following specific properties are discussed in turn and in great detail:

Specific gravity
Viscosity
Tixotropy
Separation of water
Differential settling
Salinity
Electrical conductivity
Acidity or alkalinity
Quantity of sand
Content of colloidal substances
Capacity for plasticity.

Detailed tables give numerical data on the viscosity of different mixtures of bentonite and water, the application of such mixtures, and the effect of the addition of different chemical substances, such as sodium hydroxide, acteic acid, hydrochloric acid and tannic acid, on the viscosity of the mixture.

BOLETIN DE MINAS Y PETROLEO, Vol. XIII, No. 4 (Mexico) 1942, p. 3-5.

THE MINING INDUSTRY IN MEXICO: The Mexican government is making every effort to encourage the mining industry at present in view of the need for strategic metals. The agreements made between the Mexican Government and the United States on July 15, 1941 guarantee that, for a period of 18 months, the United States of America will buy from Mexico whatever surplus antimony, arsenic, bismuth, cadmium, zinc, cobalt, copper, fluorspar, tin, graphite, manganese, mercury, mica, molybdenum, lead, tungsten and vanadium Mexico has to export, either in the form of concentrated ore or as metals. The exportable surplus is understood to be that which the Mexican producers cannot export in the normal course of international commerce. In other words, the Mexican exporters will continue to deal directly with their customers in the United States as much as possible, and the Federal Loan Agency will step into the Mexican market only in cases of emergency. The said agreements also guarantee that the United States will facilitate the shipment of industrially necessary items to Mexico inasmuch as that is possible without interfering with the National Defense program of the United States. This important clause means that the Mexican government will be able to get the equipment, machinery and supplies necessary for the maintenance and expansion of its mining industry.

Several Mexican states are showing considerable interest in exploiting metals and there has even been some exploration for new sources. Gold and silver are of particular interest in the states of Nayarit, Jalisco and Zacatecas; mercury in Chihuahua, zinc in San Luis Potosi and lead in Zacatecas.

INDUSTRY'S BOOKSHELF

WAR GASES: THEIR IDENTIFICATION AND DECONTAMINATION. New York Interscience Publishers, Inc. 1942. xiii, 180 pages, incl. indexes. Reviewed by T. E. R. Singer.

The period since Pearl Harbor has caused the publication of a number of books on civilian defense, including gas warfare, books which are of varying merit and whose authoritativeness is sometimes in question. Dr. Jacobs, formerly of the Food, Drug and Insecticide Administration of the U. S. Department of Agriculture, formerly in the U. S. Chemical Warfare Reserve, and formerly a chemist in the New York City Department of Health, writes with undoubted authority on a subject much in the public eye. This small but handy volume defines the gases, classifies them, and has chapters on the physical characteristics and physiological responses of the war gases, the effect of war gases on materials, water and food, including sampling, methods of analysis, and finally methods of decontamination of clothing, household articles, vehicles, buildings, etc., not excluding the very important factor of the decontamination and salvage of foods. This volume should be of great use not only to the layman who desires a better understanding of what the war gases are, will do, or will not do, but should also be of interest to the chemist and the skilled technician.

An Outline of Organic Nitrogen Compounds by Ed. F. Degering, Carl Bordenca and B. H. Gwynn, John S. Swift Co., Inc., Cincinnati, Ohio, 381 p., $6.00.

This represents the first planographed edition of the notes which the author has accumulated and evolved over ten years of teaching the chemistry of organic nitrogen compounds to graduate students.

The material is presented in outline form, and is accordingly brief and to the point. The total coverage, however, is quite comprehensive. It is designed for graduate students, research workers, and specialists in the field of organic nitrogen compounds.

CANADIAN REVIEW

By Kenneth R. Wilson

OTTAWA—To regulate and control the critical labor shortage in war industry, Canada's chief manpower authority (the director of National Selective Service) introduced in August a series of important restrictive steps aimed to conserve and increase manpower in essential war industry.

This program may be divided into two parts: (a) control of employment (b) labor priorities. Measures to control employment are roughly these:

(1) Subject to a series of commonsense exceptions, no employer will be able to lay off any employee and no employee will be permitted to quit his employment without giving reasonable notice in writing. A copy of this notice, which will be a "Notice of Separation," will be furnished to the nearest employment office. No employer will be permitted to interview or engage any applicant unless such applicant has a permit to seek employment from an employment office. Permits to seek employment will be given primarily to persons who produce their notices of separation or can establish that they have been unemployed or not gainfully occupied.

K. R. Wilson

(2) Control over "help wanted" and "situations wanted" advertisements. It is proposed that employers and employees may continue to advertise at their own cost but only in the name of the National Selective Service.

(3) National Selective Service officers to be authorized to require that unemployed persons, after a given period, accept any available suitable work, and that persons employed less than normal full time transfer to available, full-time, suitable work of high labor priority.

(4) If any employed person is induced by a National Selective Service officer to accept other work in which he can contribute more effectively to the prosecution of the war, that person will be entitled, upon the termination of such essential work, to reinstatement in his previous position in the same manner as members of the armed forces.

(5) Considerable discretion to grant or deny permits to seek employment, to require unemployed persons to accept work, etc., is left in the hands of local National Selective Service officers. In each case provision will be made for any aggrieved employer, employee or trade union to appeal any decision or direction of such an officer to an independent appeals board.

As to labor priorities, the attitude taken by National Selective Service officials in Canada is that it is impossible to direct labor to essential wartime uses without a schedule of labor priorities. Heretofore no overall attempt has been made to group or classify all employment in the Dominion although at the very outbreak of war, Lt. General A. G. McNaughton, now head of the Canadian Army and at that time president of Canada's National Research Commission, drew up a list of what were termed "reserve" occupations. These have been used as a rough guide to army enlistment since that time. Then also, early this year, the National Selective Service organization named a list of restricted or essential occupations and industries which were prevented from hiring male help of military help age without a special permit.

The new plan establishes a labor priority schedule under four heads; very high, high, low and unclassified. Primarily the classification is one of industries, but at the top of the list some hundreds of the more important industrial firms of the country are assigned by name to their respective classes. Because of the changing situation as to materials and war requirements it is not intended to publish this list. It is assumed, for example, that wartime chemical firms are at the top of the list; newspapers and some phases of publishing are also given an A1 priority but as at mid-August there was still considerable argument as to where an advertising salesman would rank if he were attached to an industry with high priority rating. For instance, newspaper editors were assured they would be given a high priority rating but when newspaper advertising salesmen found they were at the bottom of the list, they raised a squawk and asked how newspapers could be published unless there were advertisements to fill in around the news stories.

Canada is finding that there are untold problems when you try to classify every job and industry on the basis of its value and importance in the war effort. Our manpower experts don't pretend to have a complete answer, but their approach has been to start at the bottom of the list and weed out people who they feel can be classed as definitely unessential. At the top, they are specifying those particular firms whose workers are almost entirely essential to the war effort. There will still be a lot of middle ground in between that may never be classified before the war ends.

Another problem which has raised a lot of discussion on both sides of the border is the question of subsidies under the price ceiling. In the budget estimates which passed through Canada's Parliament late in July there was an item of $50 millions to meet estimated cost of price ceiling subsidies during the fiscal year which ends next March 31. Finance Minister Ilsley boldly defended this estimate and pointed out that if it were ten times that amount it would still be a cheap price to pay for an anti-inflationary price ceiling that really worked.

Actually on the basis of present commitments it looks as if Canada's price ceiling subsidies would run probably twice that amount (about $100 millions a year). Latest addition is an item estimated to cost $30 millions annually covering the extra cost of war risk insurance etc. in bringing oil tankers into Canadian ports. Canada is committed under the price ceiling not to raise the price of fuel, oil, gasoline, etc. so the government subsidizes the extra cost of laying down this oil through sub-infested areas.

Another big item is $15 millions to subsidize Canadian farmers for maintaining butter production; there is also about $10 millions for enabling flour millers to buy wheat at a price which will permit them to sell bread within the price ceiling. There are run-of-mine subsidies on imported merchandise of all sorts which Canadians are still able to import and which are eligible for subsidy. Amounts payable under this category run to about $500,000 a week.

The final group is due to become increasingly important—namely bulk purchasing. Under this plan the government's Commodity Prices Stabilization Corporation undertakes to purchase the entire Canadian overseas requirement of say vegetable oils, tea, raisins, etc. The government-owned company then resells this merchandise to the trade at prices which will permit sale to consumers within the price ceiling.

Evidence that the war production machinery of the two countries is being increasingly meshed is contained in a recent report of the Joint War Production Committee of the two countries. Here are some of the highlights:

Duplication in production has been greatly reduced. For instance, arrangements were made for concentration on one type of airplane propeller in the United States, and on another type in Canada. This resulted in more efficient total production to meet the needs of both countries.

Exchange of designs and information

(*Continued on page 413*)

MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

Being a Few Words About Rubber

THIS month, departing from the usual procedure, this column is to be devoted to a few words about the report of the President's special committee on rubber—the so-called "Baruch Committee." On page 397 of this issue you'll find an overall report of what the committee found to be the situation in rubber and what it recommended. These feeble words are to acquaint you with that part of the report which deals with synthetic rubber.

An ominous picture is painted by the report which claims "discomfort or defeat; there is no middle course." One note of optimism is struck, however. The report says that it may be possible to lessen the proposed curtailment measures before the end of 1943 if the synthetic rubber program which it recommends is successful. Looking over the report, there seems to be no reason why it will not be successful if the recommendations are followed out.

Production of synthetic rubber should reach its full swing before the end of 1943, the report says. As to why it did not come earlier, it adds, the committee does not intend to go into the "errors. growing out of procrastinations, indecision, conflict of authority, clashes of personalities, lack of understanding, delays and early non-use of known alcohol processes," or into the "failure to build a greater stockpile of crude rubber."

In order to prevent a recurrence of such mistakes, it recommends an immediate reorganization in method and appointment of a Rubber Administrator to have authority over the policies governing "the priceless stock of rubber now on our automobiles," and direct the technical and industrial development of synthetic rubber.

"If our hopes are realized, the production of Buna S and Neoprene (the two synthetic materials on which we now rely most to replace crude rubber) will total 425,000 tons by the end of 1943. But, on the other hand, the figure might easily fall to less than half that amount if delays occur—delays of as little as 120 days. 'Bugs' may be found in plant construction or in the operation of any one of the three processes used in the manufacture of Buna S.

Until the synthetic program comes fully to hand, the report advises that sufficient reclaimed rubber, a small amount of crude and an increased amount of thiokol or other substitutes be made available for the tire replacement and recapping program, which it is urged should go into effect at once.

It recommends measures to step up reclaiming operations to the fullest capacity and a 20 per cent expansion of existing facilities. A year will be required to increase reclaiming capacity appreciably, it finds, and reclaimed rubber, being inferior to natural rubber, is limited in use as a substitute.

Among other points to which the committee directs attention are:

"Faulty flow of critical materials may block or delay plant construction.

"No new synthetic processes are to be substituted for those approved.

"That the present program must be expanded to 1,100,000 tons of all synthetics.

"That the road rubber (rubber actually in tires now used on passenger cars and trucks) totals 1,000,000 tons.

"In rubber the United States must be listed as a 'have not' nation."

The committee then gives a digest of its findings and recommendations. (See page 406.)

The expansion of thiokol production from the present 24,000 tons to 60,000 tons a year is urged for retreads.

"With prompt action," the committee says, "this capacity can be provided by early 1943, and more than 50,000 tons produced next year."

"The conflict between the Rubber Reserve Company, a subsidiary of the Reconstruction Finance Corporation and the Office of Petroleum Coordinator has delayed and complicated the bringing in of new facilities for the production of butadiene from oil," the committee says. "To make Buna S rubber, the synthetic around which the government's program has been built primarily, three separate kinds of plants must be erected, for producing styrene, for producing butadiene, and for combining the two—polymerization is the technical term.

"At present the butadiene part of the program is lagging behind the styrene and polymerization capacity. Thus, any delay in getting the greatest possible butadiene production directly reduces the amount of synthetic rubber that will be produced.

"The production of synthetic rubber represents an investment exceeding $600,000,000 and is one of the most complicated technical projects ever undertaken, in this country. Yet, in none of the government agencies has there been a clearly recognized group of independent experts to make the technical decisions. Reliance has been placed on one part-time technical adviser, aided by committees drawn from industry. This technical adviser has testified that on more than one occasion he requested the appointment of an adequate technical staff—in vain.

"The committee has found many evidences of procedures bordering on the chaotic in which non-technical men have made decisions without consulting with subordinates nominally in the positions of responsibility.

"One example of inexplicable administration that we can mention is the failure to obtain detailed technical information concerning the experience of Soviet Russia in making synthetic rubber. Russia has been manufacturing synthetic rubber successfully for more than ten years.

"Had the offer of the Soviet Government made in February to exchange full information been accepted, it is conceivable that plants for producing synthetic rubber by the Russian processes might well be on the way to completion. To date we have no detailed information as to the Russian experience, nor analysis of Russian tires. We feel this information should still be obtained."

The report also criticizes the delay of the Rubber Reserve Company in disseminating technical information on the compounding of Buna S, a process needed in making Army tires, to the rubber companies until a few days ago, saying that it took six weeks of effort by the WPB to get this "vital information" released so that the companies could get started on the process.

In recommending a complete reorganization and consolidation of the government agencies concerned with the rubber program, it says these changes should include:

"a) A directive by the President ordering the Rubber Reserve Company and all other government agencies to act in all matters relative to the rubber program as directed by the chairman of the War Production Board.

"(b) The appointment by the chairman of the War Production Board of a rubber administrator, delegating to him full and complete authority in all matters related to rubber, including research, development, construction and operation of plants. The chairman of the WPB

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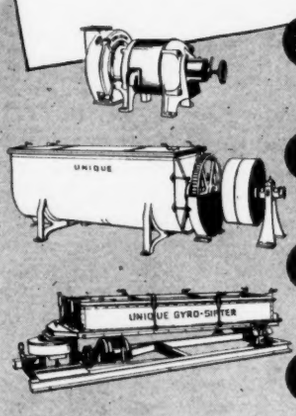

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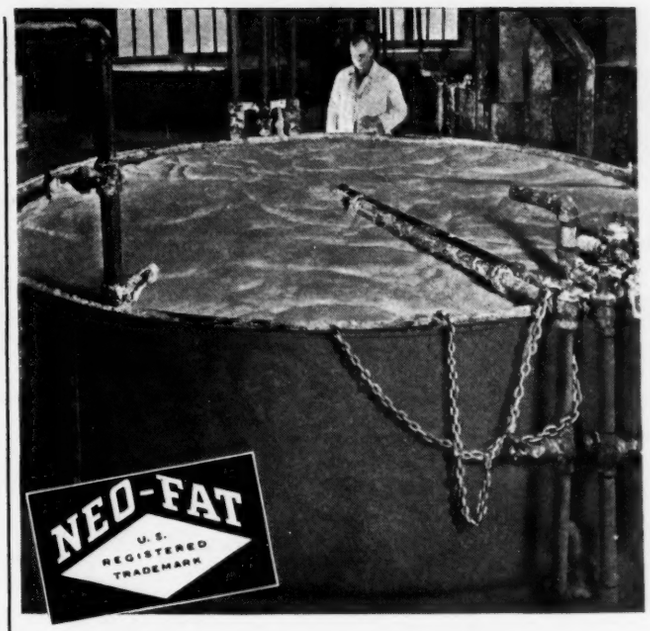

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should divest himself of all direct concern with these matters.

"(c) Establishment of an adequate technical staff, properly staffed under the immediate supervision of the Rubber Administrator, funds to be provided for these purposes.

"That the Petroleum Coordinator be directed by Presidential order to act on specific directives from the Rubber Administrator to explore all methods for the production of butadiene from petroleum and natural-gas products and to recommend new proposals to the Rubber Administrator for consideration and action. However, to make certain there are on construction delays because of conflicting authority, the construction of all plants and equipment concerned with the production and purification of butadiene from oil shall be under the direction of the Rubber Administrator.

"The Petroleum Coordinator shall supervise the operation of these plants, after construction, but he shall not change the presently authorized program (or plans for operation) except as approved by the Rubber Administrator.

"In delegating this added responsibility to the Petroleum Coordinator, the committee has sought to secure complete coordination of the butadiene-from-oil program with other petroleum and natural gas requirements, especially for aviation gasoline and for toluene for explosives.

"The committee has investigated, with the aid of its experts, the status of the present government program for the production of synthetic rubber and believes that every one of the processes is technically sound and ultimately will work.

"In war one cannot wait upon perfection. Any weapon on the battlefield is better than the best weapon on a blueprint. The committee recommends that the present program be pushed forward with the greatest possible speeed, without further change, except that if new projects are adopted, they be made additions to the present program.

"The committee has examined the present status of the government's schedules and estimates that if the present construction program can be met on the dates specified and technical difficulties in reaching full production are overcome, there will be produced during 1943:

"400,000 tons of Buna S;

"30,000 tons of neoprene (in part from private sources);

"62,000 tons of butyl rubber; and

"24,000 tons of thiokol (from private sources).

"Only Buna S and neoprene can be used for the combat and heavy duty tires. Between them, these two synthetics and a portion of the butyl rubber could offset the likely deficit of crude rubber which the country faces during the critical year of 1943.

As to the shortage of critical materials, which it blames chiefly on ineffective methods used to distribute materials and control priorities, the report says that unless the flow of materials for the construction of synthetic rubber plants is insured, there will be no rubber in the fourth quarter of 1943 with which to equip a modern mechanized army.

"The year 1943 is so critical for the rubber situation that the production of 100,000 or 200,000 tons of Buna S may be the determining factor in the success of our military program. The committee recommends these additions to program.

"A. An increase in the production of butadiene by 100,000 tons to be obtained from a refinery conversion program, more commonly known as 'quick butadiene.' This process utilizes refinery equipment made idle by the lessened demand for gasoline and which can be brought into production in six months. Since butadiene output is lagging behind styrene and polymerization capacity, if this additional butadiene can be made available quickly enough, an additional 40,000 to 50,000 tons of synthetic rubber could be produced in the critical year of 1943.

"The committee is concerned by the efforts on the part of many persons to substitute this so-called 'quick-butadiene' process for the regular butadiene plants scheduled in the government's program. The first thought that occurs to the committee is 'why now? Why not months ago? Why the sudden activity?' And above all, 'Why substitute at this late date?' The committee recommends the quick-butadiene program as an addition to, not a substitution for, the present program.

"B. In addition to the increase provided for through the refinery-conversion program, the committee recommends another increase of 30,000 tons of Buna S. This should come from a plant to be erected during the latter part of 1943 to come into operation early in 1944.

"There are two advantages in delaying construction until this time. There is good reason to believe that with the completion of the present huge war-construction program, the present tightness of critical materials will be less acute and facilities for fabricating and for chemical equipment will be more readily available. Second, within the next three months it will be possible to judge better as to the relative merits of two processes for making butadiene from grain which are not now in the government program—the so-called polish process from alcohol and the butylene glycol process from grain.

"The plants for the production of this additional 30,000 tons of Buna S by a grain-using process should be located near the grain area. Such units should preferably be operated under the control of a local group.

"The estimates of alcohol supplies and needs given us by different agencies vary considerably. If no additional alcohol is provided for the expanded rubber program we have recommended, there is a possibility that at some time in the future the production of smokeless powder and other munitions may soar and alcohol be diverted from the making of rubber. We recommend that facilities for the production of 100,000,000 gallons of alcohol be erected on sites near the grain-producing areas and accessible to water transportation. This would make it possible for molasses to be brought to the plants by barges after the war in the event that the manufacture of alcohol from grain proves uneconomical.

"As a margin of safety on the military side, we recommend the construction of 20,000 tons a year of additional neoprene capacity.

"Neoprene is the one synthetic rubber which has been shown to be the full equivalent in quality of natural rubber for combat and heavy-duty tires, either by itself or in combination with Buna S.

"The War Production Board has fixed the total annual output of Buna S rubber at 705,000 tons for the United States. The committee recommends that this ceiling be raised by 140,000 tons to 845,000 tons. Additional styrene and polymerization capacity should be built, as necessary, to take care of the increased production of butadiene. This expansion should be directed to produce the maximum possible amount of Buna S before Jan. 1, 1944.

"In addition to Buna S, the expanded program recommended by the committee calls for 69,000 tons of neoprene, 60,000 tons of thiokol, 132,000 tons of butyl, with other synthetics like flexon being added to the program if they can be brought in during 1943 after being adequately tested.

"In concluding this summary of findings and recommendations, the committee wishes to point out that never before has this country embarked on an undertaking comparable to the development of the synthetic rubber program. It is not only an ambitious technical project that must be rushed to completion at breakneck speed, but in large measure it is a new political and economic undertaking.

"In drawing up these recommendations the committee has sought to find a basis upon which the entire nation can go forward together, uniting our energies against the enemy instead of dissipating them in domestic wrangling. It appreciates that it is asking the public to make sacrifices because of mistakes that have been made and for which the people are not to blame. But wrong things done in the past cannot be cited as a defense for making mistakes in the future. The war demands that we do these things. Victory can be won in no other way."

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U.S.I. CHEMICAL NEWS

September ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

Indian Plant Lore May Provide Source Of Novel Perfumes

Possibility of Distinctively American Fragrances Foreseen

Novel perfume fragrances, distinctively American in character, may have their origin in the knowledge of aromatic plants possessed by the Indians of Arizona and adjacent states, it has been suggested as a result of recent studies by the Department of Agriculture.

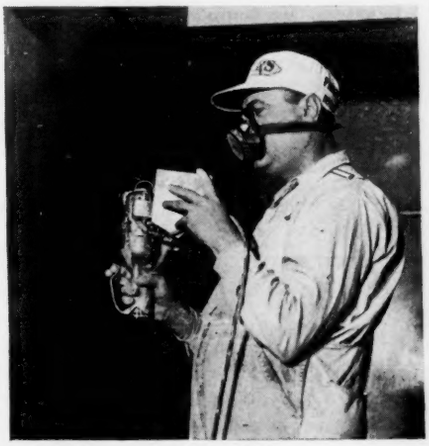
The ancient plant lore of the tribes of the Southwestern portion of the United States is believed to include considerable knowledge of drug and aromatic principles which are unknown in most pharmacopœias. This fact acquires special importance in view of the current shortage of many natural perfume

(*Continued on next page*)

Paint Reclamation Urged As Aid to Conservation

Reclamation of spray paints has been suggested by the War Production Board as a step in the conservation of chemicals important in war production.

Large quantities of nitrocellulose, pigments, resins, plasticizers and other materials can be recovered by reclaiming the sludge formed by the surplus paint in spray booths, it is believed. Satisfactory procedures and adequate equipment for the reclaiming process are believed to exist.



Surplus paint used in the spray process may serve as a source for the recovery of many important chemicals.

Ethanol, Acetone Used in Sulfanilamide Preparation

Ethanol and acetone are used in a sulfanilamide preparation recently described in England as being especially useful for a throat paint or spray. The preparation has the following proportions:

Sulfanilamide	1.7 gm.
Ethanol (90%)	7.5 cc.
Acetone	7.5 cc.
Glycerine, to make	100.0 cc.

Phthalate Plasticizers Under Total Allocation

Phthalate plasticizers, used in the manufacture of lacquers, plastics, and other products, have been placed under total allocation control under the terms of an order which became effective September 1.

U.S.I. products affected by the order include diamyl, dibutyl, and diethyl phthalates.

New Coating Composition Prevents Color Bleeding

SOUTH RIVER, N. J. — The tendency of coating compositions containing asphaltic materials to "bleed" into the finish coat can be almost completely eliminated by the use of a recently patented composition, it is claimed.

The new composition is applied as an intermediate coating, and is said to provide good adhesion for the top coat. Its effectiveness in preventing bleeding is reported to depend on the presence of activated carbon. A number of possible formulations are suggested in the patent, the simplest of which employs the activated carbon in a solution of shellac in Specially Denatured Alcohol 23A.

Tests are said to show that such compositions are highly effective in preventing discoloration of top coats, even when the undercoat contains coloring materials which usually cause severe "bleeding."

Urethan Aids in Forming Barbituric Acid Solutions

The presence of a relatively large quantity of a carbamic ester, such as urethan, is helpful in forming concentrated stable solutions of barbituric acids, according to a recent British patent.

As a typical example of the procedure, 20 grams of 5-isobutyl-5-allylbarbituric acid, 5.5 grams of monoethanolamine, and 50 grams of urethan are dissolved at room temperature in 34 cc. of water. A stable solution, containing 20% by volume of isobutylallylbarbituric acid is reported to be obtained.

Urethan is produced by U.S.I.

Resin Emulsions Seen as Possible Latex Substitutes

Suggested for Use in Coatings, Adhesives, Other Applications

PEABODY, Mass. — Resin emulsions display interesting potentialities as substitutes, extenders, and modifiers for latex in a variety of applications, according to a manufacturer here.

Adhesives, binders and fillers, grease-proofing, waterproofing, impregnating, and coating compounds are among the uses in which the resin emulsions are said to have excellent results. In the field of coatings, they have been employed to produce adherent coatings, either pigmented or clear, for paper, fabric, and rubber, and as intermediate coats for lacquer on rubberized cloth. In latex-treated papers, they are reported to give increased strength and improved ageing characteristics. Typical applications among adhesives include those for paper, leather to cloth, and cloth to cloth.

These emulsions are described as available in a variety of forms, including alkyds, maleics, and acrylics, for a wide range of applications.

Color of Oils and Waxes Improved by New Process

SARNIA, Ont. — The effectiveness of clay, fuller's earth, and similar adsorbent materials in improving the color of oils and waxes is materially enhanced by wetting the adsorbent with an aliphatic alcohol, particularly ethanol.

This discovery has been made by an inventor here, who has received a patent on the process. The process can be utilized, according to the inventor, either to obtain a good color reduction with less adsorbent material, or to obtain a greater color reduction with the same amount of material. The method is expected to be particularly applicable to the refining of waxes in which extremely light color is desirable.

pH determinations are among the many tests conducted by U.S.I. as part of its rigid control of production processes, to assure high quality of its products.

Shear Strength Tests Suggested to Evaluate Solvents for Plastics

LOS ANGELES, Calif. — Determination of shear strength has been suggested here as a simple method of evaluating the effect of organic solvents on various types of plastics.

While considerable data have been massed on the effect of solvents on plastics, it has been pointed out that this information has been largely of a quantitative nature, classifying the plastic as soluble, partly soluble, or insoluble in the solvent.

The shear strength determinations are reported to offer an easily applied technique for obtaining quantitative data on solubility, and thus obtaining comparative information on the effect of various solvents. Information thus obtainable may be helpful in a variety of industrial applications, such as the formulation of lacquers and adhesives.

Suggests Black Cosmetic Cream for Commando Use

LONDON, England — The possibility that the cosmetic industry may find a new outlet for its products, through the development of a black cream to cover faces of Commandos during night raids, has been suggested by a trade journal here.

Such a cream, it is pointed out, should be non-irritating and easily applied, capable of application to the eyelids without harmful effects, and displaying good adhesion in the presence of perspiration.

Indian Plant Lore May be Source of New Perfumes

(*Continued from previous page*)

materials which have been widely used in the past. However, if further studies bear out the possibility of utilizing perfume materials from these newer sources, their use will probably not be confined to the present emergency. Since they may offer a starting point for products with definitely new odors, they may find a permanent place for themselves in perfume manufacture.

It has been suggested that the Indians, on the basis of their ancient knowledge, may distill the aromatic oils for subsequent fractionation and blending by Government laboratory workers.

Plastic May be Employed For Rubber Conservation

ST. LOUIS, Mo. — Much of the rubber previously used in rubberized fabrics may be successfully replaced by a novel plastic, it has been reported here.

The plastic, it is said, can be so compounded that it can be applied to fabric with the same equipment and processes used for rubber, thus eliminating the need for new machinery or techniques. Fabrics coated with the plastic have already been used for military raincoats, hospital sheeting, life-preserver jackets, and water bags, it is claimed. In the case of military raincoats, it is said that the plastic-treated fabrics have the added advantage of resulting in a lighter-weight coat than the present rubberized materials. Effectiveness of waterproofing is described as being at least equal to that of natural rubber.

Ethanol Used in Depositing Metal on Cellulose Esters

LONDON, England—A method for depositing metals, such as silver, gold, platinum, or copper, on the surfaces of cellulose esters is described in a patent recently issued here. The surface of the cellulose ester is pretreated with a bath containing a stannous compound dissolved in a mixture of ethanol and water, according to the patent. Water content may range between 5% and 80% of the bath.

Describes Hand Lotion For Dermatological Use

DETROIT, Mich. — A new hand lotion, said to have unusually desirable qualities for dermatological use, is described here as having the following proportions:

Stearic acid	1.75 gm.
Glycerine	1.00 cc.
Cholesterol base	0.50 gm.
Cetyl alcohol	0.50 gm.
Triethanolamine	0.15 cc.
Alcohol (15%), to make	100.00 cc.

After the stearic acid and triethanolamine are allowed to react, the cholesterol, cetyl alcohol, and glycerine are added. The mixture is melted and the alcohol added.

One advantage of this lotion is said to lie in the fact that the emulsion displays no tendency to break down. In addition, the lotion is said to tolerate a variety of dermatological medicaments, such as calamine, zinc oxide, kaolin, salicylic acid and boric acid.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

Copper oxide scale is easily removed from the surface of brass by means of a chemical compound now in commercial production, it is reported. It is said to remove the stains quickly and with little loss of metal. **(No. 610)**

U S I

Lubricating and rustproofing properties are said to be combined in a new liquid intended for application to steel. The liquid provides lubrication comparable to that offered by soluble oils, and dries to a protecting film to prevent rusting prior to shipment. **(No. 611)**

U S I

A stop-off lacquer is designed for application to steel pieces that are to be locally hardened, according to the manufacturer. Lacquer is applied to areas to be hardened, after which piece is copper-plated. Plated areas remain soft; lacquer prevents plate from forming on areas to be hardened. **(No. 612)**

U S I

Cleaning of plastic surfaces is readily accomplished by means of a new material, it is claimed. Cleaner is said to remove grease, gum, paint, and other foreign materials from the surface of the plastic, without harming the plastic itself. **(No. 613)**

U S I

A protective coating is said to display high resistance to the effects of weather, hot oil, alcohol, inorganic acids, caustics, and ultraviolet rays. It is also reported to show unusual arc resistance, high dielectric strength, and extreme flexibility. Coating contains materials said to be available on priority ratings of A-3 or better. **(No. 614)**

U S I

A single-coat paint is reported to prime, seal, and finish any interior surface in a single operation. It can be applied over plastic, concrete, brick, wallboard, and metal, and has sufficient hiding power for application over dark surfaces, according to the maker. **(No. 615)**

U S I

A new window material consists of wire mesh enclosed by plastic. Maker says that sheet is transparent, insulates against heat, transmits ultra-violet rays, displays high shock resistance. **(No. 616)**

U S I

Weatherproofing of prefabricated metal shapes can be accomplished by a new process said to afford a high degree of protection against corrosive atmospheres. Process is applied only to prefabricated shapes in order to avoid possible rupture of bond. **(No 617)**

U S I

A blood-clotting agent is now available for the use of doctors and dentists in stopping the flow of blood from small wounds. It is said to be the natural clotting constituent of blood separated in highly concentrated form from clear blood plasma. **(No. 618)**

U S I

A perilla oil substitute available from a domestic source is said to offer a satisfactory replacement for a product now difficult to obtain. **(No. 619)**

U.S.I. INDUSTRIAL CHEMICALS, INC.

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Amyl Acetate
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Dibutyl Oxalate
Diethyl Oxalate

PHTHALIC ESTERS
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate

OTHER ESTERS
*Diatol
Diethyl Carbonate
Ethyl Chloroformate
Ethyl Formate

INTERMEDIATES
Acetoacetanilide
Acetoacet-ortho-anisidide
Acetoacet-ortho-chloranilide
Acetoacet-ortho-toluidide
Acetoacet-para-chloranilide
Ethyl Acetoacetate
Ethyl Benzoylacetate
Ethyl Sodium Oxalacetate

ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

OTHER PRODUCTS
Acetone
Collodions
*Curbay B-G
*Curbay Binders
*Curbay X (Powder)
Ethylene
Ethylene Glycol
Nitrocellulose Solutions
Potash, Agricultural
Urethan
*Vacatone

*Registered Trade Mark

THE WILLIAMS BROTHERS

(*Continued from page 347*)

papers describing researches in Bell Telephone Laboratories with which he had a personal connection. In 1935 the University of Ottawa (Kansas), conferred on him the honorary degree of Doctor of Science; in 1938 he was honored in the same way by Ohio Wesleyan University, and the University of Chicago awarded him an honorary doctorate at its Fiftieth Anniversary Celebration, September 29, 1941. Columbia and Yale Universities followed suit in 1942. He received the Willard Gibbs Medal of the American Chemical Society in 1938; in 1940 the Elliott Cresson Medal of Franklin Institute, and in 1942, the John Scott Medal of the City of Philadelphia and, jointly with his brother Roger, the Chandler Medal. Industrial recognition came to him with his designation as a Modern Pioneer by the National Association of Manufacturers in 1940 and with the Award of the Associated Grocery Manufacturers Association in 1941.

Dr. Williams is a member of the National Research Council Food and Nutrition Board, and as chairman of the committee on Cereals is taking a leading part in the introduction of enriched bread and enriched flour which are expected to play an important role in eliminating deficiency diseases from American life.

Roger Williams was entering college at Redlands, California, when his elder brother first began his studies of the "beriberi preventing substance." When Roger returned home a year later, he heard the story of this deficiency disease and then had planted in his mind ideas which helped to shape his career toward biochemistry.

After two years of high school teaching of chemistry, Roger spent a year in graduate study at the University of California and two years at the University of Chicago, receiving his Master's degree in 1918 and his Doctorate in 1919 at the latter institution. While still a student under a Fleischmann fellowship, he undertook to verify the findings of Ide and Wildiers regarding the growth stimulating principle called "bios," and to apply them to yeast culture. The "bios" problem was destined to become the subject of his most vital interest through a period of nearly twenty years.

After a few months of industrial work for the Fleischmann Company, he decided quite definitely in favor of an academic calling and entered the University of Oregon as assistant professor of chemistry. A decade later his expanding responsibilities took him to Oregon State College where he progressively found greater freedom for research, culminating in 1939-1940 in the determination of the structure of pantothenic acid and its synthesis. This substance was one of the components of the vague "bios" of the period twenty years earlier. It made history in that it represents the first example of a compound whose structure has been elucidated in spite of the fact that its isolation from nature in pure form has so far baffled the ingenuity of chemists. Working with the purest material he could obtain, Professor Williams devised new modes of characterization of the substance in terms of physico-chemical and physiological properties which furnished the clues for the later verification of its structure by synthesis at the Merck Laboratories, with his assistance. His work with pantothenic acid won him an honorary degree from his alma mater, Redlands, in 1934, and also the Mead Johnson

(*Continued on page 431*)

CANADIAN REVIEW

(*Continued from page 409*)

about methods has been mutually beneficial. In one instance, clearance through a joint subcommittee made it possible for Canada to avoid costly plant expansion to produce a critical chemical, adequate supplies being obtained from the United States.

Manufacture of common types of material has been increased. For example, alteration of specifications for a Canadian gun carrier brought about use of facilities in both Canada and the United States, to supplement each other in turning out finished munitions for armies of the United Nations.

Short-term gaps in supplies and equipment have been closed, by getting materials from the other country. Canada shipped to the United States 500,000 each of shell bodies, fuzes and tracers for a certain type gun, during a period when Canadian supply was running ahead of schedule. The shells were loaded and are now being used by United States troops. On the other hand the United States shipped 150,000 body castings for a certain type shell, with the result that Canadian plants were able to load and ship finished rounds on schedule.

Steel plates and frames for Canadian merchant shipbuilding were delivered quickly from the United States, following prompt action by the Maritime Commission. As result, several hundred thousand tons of merchant ships will slide down Canadian ways in 1942. Without the plates, output would have been not more than two-thirds of this. In another instance, working through the Joint Committee, the United States Navy Department got quick delivery from Canada of 30,000 pounds of urgently needed optical glass for sights.

Transportation facilities have been diverted to more essential war work, Canadian Great Lakes grain boats will be switched this summer and fall to the movement of iron ore between United States ports. This will make possible the shipment of an extra two and one-half million tons.

Elimination of tariffs and red tape at the border has wiped out bars to effective integration of production facilities. By a series of broad Orders in Council, Canada permits entry, free of duty and taxes, of practically all war production goods purchased by the Department of Munitions and Supply or its duly authorized Agents. On its part the United States, under provisions of an Executive Order of June 1, 1942, suspends tariff barriers on all war supplies imported by government departments. Canada is modifying her regulations with respect to the movement of goods by truck in bond across Ontario between Michigan and New York so as to permit free movement of all war materials.

Cost-of-Living Bonus

In spite of price ceilings a rise of 2.4 in the cost of living (due principally to increase in prices of foodstuffs) resulted in an additional cost-of-living bonus of 60 cents a week to employees earning $25 a week or more, and 2.4% of weekly wage to men under 21 and women earning less than $25 per week. This, in most cases, brings total cost-of-living bonus now being paid to $4.10 per week or within 15 cents of the maximum to be paid (4.25 or 17%). It is estimated that the additional 2.4 rise in cost-of-living bonus will put $1,000,000 a week into the pockets of employees and (with price ceilings) will take that much additional out of what profit is left in industry's pockets.

The drain on man power is daily becoming more acute. Twenty thousand men are to be called up for military service in September (25,000 was the August quota). This in a country in which industry has already been severely depleted of men is becoming more and more serious.

Fellner with Fuld

Dr. Joe Fellner, for many years a chemist in the Department of Agriculture of France, has been engaged as a chemist by Fuld Bros., Baltimore, manufacturers of sanitary chemicals. He begins his new work Oct. 1.

Frances Richards, formerly in the pharmaceutical and industrial chemical brokerage business under her own name, is now associated with the Duff Chemical Co., N. Y. City.

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 Aug. 1942 $0.93

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks	lb.	...	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks	lb.	...	.12	.12	.11	.13
Acetamide, tech, kgs, wks	lb.	.28	.50	.28	.50	.28	.45
Acetanilid, tech, cryst, bbls	lb.	.29	.31	.29	.31	.29	.31
powd, bbls	lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd	lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs	lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*)	lb.	.07	.158	.07	.158	.06	.158
drs, c-l, delv (*PC*)	lb.	.08½	.168	.08½	.173	.07½	.173
Acetonitrile, drs, wks	lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs	lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs	lb.	...	1.00	1.00	1.00	1.00	1.00
ACIDS							
Acetic, 28%, bbls (*PC*) 100 lbs.		3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls	100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs	100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks	100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls	lb.	...	.45	.45	.45	.45	.45
Standard USP	lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks	lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls	lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls	lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*)	oz.	1.50	1.70	1.50	1.85	1.85	2.10
Battery, cbys, wks	100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls	lb.	.43	.47	.43	.47	.43	.47
USP, bbls	lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, frt all'd bgs 40 tons	ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls	ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls	lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks	lb.	...	.22	.22	.22	.22	.22
tks, wks	lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks	lb.	...	.35	.25	.35	.25	.30
Chlorosulfonic, drs, wks	lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks	lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*)	lb.	.16¼	.18¾	.16¼	.18¾	.15¾	.17¼
Citric, crys, gran, bbls	lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*)	lb.	.22½	.26½	.22½	.26½	.23	.26½
Cleve's bbls	lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A)	gal.	.81	.83	.81	.86	.76	.84
Low Boiling	gal.	.81	.83	.81	.86	.76	.84
Formic, tech, cbys	lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls	lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls	lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls	lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks	lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic							
Hydrocyanic cyls, wks	lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks	lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls	lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22% dark, bbls	lb.	.029	.0315	.029	.035	.02½	.035
22%, light, bbls wks	lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks	lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks	lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs	lb.	.20	nom.	.20	.20½	.15	.18¾
Laurent's bbls	lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs	lb.	...	.30	.30	.30	.30	.30
Anhydride, drs	lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs	lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit	lb.	.05	.06	.05	.06	.05	.06
S unit	lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks	lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls	lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls	lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks	100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks	100 lb.	...	1.05	1.05	1.05	1.05	1.05
20° cbys, c-l, wks	100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks	100 lb.	...	1.15	1.15	1.15	1.15	1.15
22° cbys, c-l, wks	100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks	100 lb.	...	1.65	1.65	1.65	1.65	1.65
Acid (continued): CP cbys	lb.	.06½	.08	.06½	.08	.06½	.08
Myristic, dist, drs	lb.	.19	.19½	.18	.19½	.18	.18½
Naphthenic drs, 220-230	lb.	...	.13	.10	.13	.10	.10
tks, wks (A)	lb.	...	.10	.09	.10	.09	.09
Naphthionic, tech, bbls	lb.	.60	.65	.60	.65	.60	.65
Nicotinic fib-dms	lb.	5.00	5.50	5.00	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks	100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks	100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks	100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks	100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys	lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks (*PC*)	lb.	.11¼	.12½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys	lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal	100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs	lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks	lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks	lb.	...	.14	.14	.14	.14	.14
tks, wks	lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls	lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns	lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.		...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks	lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks (*PC*)	lb.	...	.33	...	.33	...	.33
USP, bbls	lb.	.35	.46	.35	.46	.35	.40
Sebasic, tech, bbls, wks	lb.	.65	.69	.65	.82	.82	.82
Stearic, see under Oils & Fats							
Succinic, bbls	lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks	lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks	ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks	100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks	ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks	100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks	lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks	ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls	lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls	lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls	lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles	lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure 100 lb. pkg. (A)	lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks (A)	lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls	lb.	.65	.70	.65	.75	.55	.75
dark, bbls	lb.	...	.13½	.12½	.14	.13	.18
egg, edible	lb.	1.73	1.78	1.73	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv	lb.	...	.131	...	.131	.111	.131
c-l, drs, delv	lb.	...	.141	...	.141	.121	.141
lcl, drs, delv	lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich.	lb.	...	.27	.27	.42	.25	.27
secondary, tks, delv	lb.	...	.09½	...	.09½	...	.09½
drs, c-l, delv E of Rockies	lb.	...	.09	...	.09	...	.09
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd	lb.	.65	.75	.65	.75	.65	.75
Benzyl, cans	lb.	.13½	.168	.12½	.168	.09	.158
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) (A)	lb.	.14	.173	.13½	.173	.10	.168
c-l, drs, f.o.b. wks, frt all'd	lb.	...	.08½	...	.08½	.07¼	.08½
Butyl, secondary, tks, delv	lb.	...	.09½	...	.09½	.08¼	.09½
c-l, drs, delv	lb.	...	.12½	...	.12½	...	.12½
Butyl, tert denat c-l drs	lb.	...	.13	...	.13	...	.13
lcl drs	lb.	...	.11½	...	.11½	...	.11½
tks	lb.	...	.16	...	.16	...	.16
Capryl, drs, crude, wks	lb.	3.00	3.60	3.00	3.60	2.33	3.60
Cinnamic, bottles	lb.	...	.65	...	.65	.36½	.45½
Denatured, CD, 14, c-l drs, wks (*PC*, *FP*)	gal.	...	.58	...	.58	.26½	.58
tks, East, wks	gal.	...	.53	...	.53	.28½	.53
Denatured, SD, No. 1, tks,							

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Resins Are Important in the War Effort

Our research has been successfully directed towards the manufacture of S & W Resins that meet the specifications set up by the Government agencies. Where critical raw materials are involved, we are delivering resins against the proper preference ratings, and whenever possible are maintaining stocks in the large production centers throughout the country so that they are available to manufacturers without delay.

We anticipate having, as before, for use in the production of essential civilian finishes, limited quantities of certain resins that do not require critical raw materials.

The Complete Resin Line

"S & W" ESTER GUM—all types
"AROCHEM"—modified types
"AROPLAZ"—alkyds
"AROFENE"—pure phenolics
CONGO GUM—raw, fused and esterfied
NATURAL RESINS—all standard grades

STROOCK & WITTENBERG CORPORATION

60 EAST 42nd STREET NEW YORK

ABC

U. S. P. FORMALDEHYDE

Manufactured by
Our Associated Company

KAY FRIES CHEMICALS, INC.
West Haverstraw, New York

TANK CARS - BARRELS - DRUMS

AMERICAN-BRITISH CHEMICAL SUPPLIES, Inc.
180 MADISON AVE., NEW YORK, N.Y.

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv	lb. *f*	.11½	.14½	.11½	.14½	.09½	.13
tks, delv	lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv	lb.	.11	.13½	.11	.13½	.09	.12
tks, delv	lb.	.10	.12½	.10	.14	.10	.12½
Ethyl, 190 proof molasses, tks	gal. *g*	...	8.12	...	8.12	5.96½	8.12
c-l, drs	gal. *g*	...	8.19	...	8.19	6.02½	8.19
c-l, bbls	gal. *g*	...	8.25½	...	8.25½	6.03½	8.25
Furfuryl, tech, 500 lb. drs	lb.	.20	.35	.20	.35	.20	.25
Hexyl, secondary tks, delv	lb.	...	.23	...	.23	.12	.23
c-l, drs, delv	lb.	...	.24	...	.24	...	.13
Isoamyl, prim, cans, wks	lb.	...	.32	...	.32	...	.32
drs, lcl, delv	lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs	lb.	...	.086	...	.086	.079	.086
c-l, drs	lb.	...	.076	...	.076	.069	.076
tks	lb.	...	.076	...	.076	.069	.076
Ethylhexyl, tks, wks	lb.	.23	.25	.23	.25	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd	gal.	.40½	.43½	.40½	.43½	.40½	.43½
tks, frt all'd	gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd	gal.	.44	.47	.44	.47	.44	.47
tks, frt all'd	gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl							
Polyvinyl A fib drs	lb.	...	.65	.54	.65	.26	.54
B fib drs	lb.	.60	.65	.60	.70	...	...
Propyl, nor, drs, wks	gal.	.67	.70	.69	.75	...	...
Spec Solvents, East, drs, wks	gal.	...	.61	.61	.70	...	...
tks, East, wks	gal.	...	.54	.54	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks	lb.	.44	.50	.44	.50	...	...
Aldehyde ammonia, 100 gal drs	lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv	lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv	lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls	lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls	lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75	4.25
delv NY, Phila	100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls wks	100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks	100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks	100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks	100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks	100 lb.	...	3.25	...	3.25	...	3.25
Chrome, bbls	100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*)	100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls	lb.	.09½	.10½	.09½	.11	.10½	.11
Basic powd, bbls, delv	lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv	lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks	lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks	lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks	lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv	lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv (A)	lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks	lb.	...	.034	...	.034	.029	.03½
Oleate, drs	lb.	...	.24½	.17½	.26	.17½	.20
Palmitate, bbls	lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls	lb.	...	.15½	.15	.15½	...	.15
Stearate, 100 lb bbls	lb.	.23	.24	.22	.24	.18	.23
Sulfate, com, c-l, bgs, wks	100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks	100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks	100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks	100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks	lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl	lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv	lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 cont.		...	.04	.04	.08z	.04	.05¼
Ammonium Acetate, kgs	lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks	100 lb	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls	lb.	.16	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls	lb.	.08¾	.09¼	.08¼	.09¼	.08¼	.09¼
Chloride, White, 100 lb. bbls, wks	100 lb.	...	4.45	4.45	...	4.45	...
Gray, 250 lb bbls, wks	100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls	lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls	lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls	lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs	lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls	lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs (A)	lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs	lb.	.25½	.28½	.21	.28½	.21	.22

z On a f.o.b. wks. basis.
(A) Allocation

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):						
Phosphate, diabasic tech, powd, 325 lb bbls	lb.	...	.07¼	.09¼	.09¼	.07¼	.09¼
Ricinoleate, bbls	lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls	lb.	...	.24½	...	.24½	...	.24½
Paste, bbls	lb.	...	.06½	...	.06½	...	.06½
Sulfate, dom. f.o.b., bulk (A)	ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs	lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane) tks, delv	lb.	...	.145	...	.145	.105	.145
c-l, drs, delv	lb.	...	.155	...	.155	.115	.155
lcl, drs, delv	lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv	lb.	.14½	.17	.14½	.17	...	.14½
Secondary, tks, delv	lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv	lb.	...	.09½	...	.09½	...	.09½
tks, delv	lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks	lb.	no prices		.56	.68	.56	.68
mixed l c l drs, wks	lb.	...	.08	...	.08	.0565	.08
tks, wks	lb.	...	.06	...	.06	.0465	.06
Amyl Ether (see Diamyl lcl, dms	lb.	...	.102	...	.102	...	...
cl, dms	lb.	...	.095	...	.095	...	...
tks	lb.	...	.085	...	.085	...	...
Mercaptan, drs, wks	lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs	lb.	...	.31	...	.31	.25	.31
Stearate, lcl, wks, drs	lb.	...	.32½	...	.32½	.26	.335
Amylene, c-l, drs, f.o.b. wks,	lb.	...	.102	.102	.11	.102	.11
lcl, dms, f.o.b., wks		...	.11	...	.11	...	...
tks, f.o.b., wks	lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes							
Aniline Oil, 960 lb drs and tks	lb.	.12½	.16	.12½	.16	...	.14½
Annatto fine	lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85%	lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls	lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots	lb.	...	.14½	.14	.14½	.14	.16½
Butter of, see Chloride							
Chloride, soln, cbys	lb.	...	.17	...	.17	...	.17
Needle, powd, bbls	lb.	.18½	.20	.18½	.20	.16	.18
Oxide, 500 lb bbls (A)	lb.	.15	.15½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs	lb.	...	.40	.34	.40	.28	.34
Archil, conc, 600 lb bbls	lb.	...	.26	...	.26	no prices	
Aroclors, wks	lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls	lb.	.09½	.09¾	.09½	.10¾	.09½	.10¾
Arsenic, Metal	lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs	lb.	no prices		no prices		no prices	
White, 112 lb kgs. (A)	lb.	.04	.04¼	.04	.04¼	.03½	.04¼
B							
Barium Carbonate precip, 200 lb bgs, wks	ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs	ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY (A)	lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1	ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs	lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls	lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls	lb.	.11	.12	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks	ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk mines (A)	ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks	ton	...	16.00	...	16.00	...	16.00
200 mesh	ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks	lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd	gal. (A)	...	.15	...	.15	.14	.15
90% c-l, drs	gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd	gal.	...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls	lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs	lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs	lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks	lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls	lb.	...	1.25	1.25	...	1.25	1.35
Tech, 200 lb bbls	lb.	...	.51	...	.51	.51	.52
Bismuth metal	lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes	lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes	lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes	lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, fib dms	lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs	lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs	lb.	1.29	1.57	1.29	1.57	1.20	1.57
Trioxide, powd, boxes	lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks	ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.		2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks	lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY	unit	5.60	5.75	5.25	5.75	4.75	5.25
Chicago, high grade	unit	5.70	5.75	5.40	5.80	5.00	5.40
Imported shipt	unit	5.45	5.50	5.00	5.50	4.75	5.00
Blues, Bronze Chinese							
Prussian Soluble	lb.	...	.36	...	.36	.33	.36
Milori, bbls	lb.	...	.36	...	.36	.33	.36

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

Church & Dwight Co., Inc.

Established 1846

70 PINE STREET NEW YORK

Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

Standard Quality

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Blues (continued):						
Ultramarine,* dry, wks, bbls	lb.	.12	.13	.11	.13	...	.11
Regular grade, group 1	lb.	.17	.27	.16	.27	.16	.20
Pulp, Cobalt grade	lb.	.23	.27	.22	.27	.22	.24
Bone, 4½ + 50% raw, Chicago	ton	39.00	40.00	39.00	40.00	30.00	40.00
Bone Ash, 100 lb kgs	lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50% imp	ton	...	37.50	...	37.50	31.50	37.50
Domestic, bgs, Chicago	ton	38.00	40.00	38.00	40.00	32.00	40.00
Borax, tech, gran, 80 and 40 ton lots, bgs, delv	ton *j*	...	46.00	45.00	46.00	43.00	45.00
bbls, delv (*FP*)	ton *j*	...	55.00	54.00	55.00	53.00	56.00
Tech, powd, 80 and 40 ton lots, bgs	ton	...	51.00	50.00	51.00	48.00	50.00
bbls, delv	ton	...	60.00	59.00	60.00	58.00	61.00
Bordeaux Mixture, drs	lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases	lb.	.25	.30	.25	.30	.25	.30
Bronze, Al, pwd, 300 lb drs (*FP*)	lb.	...	.59	...	.59	...	.57
Gold, blk	lb.	.60	.65	.60	.65	.60	.65
Butanes, com 16-32° group 3 tks (*PC*)	lb.	.02½	.03½	.02½	.03½	.02½	.03
Butyl, acetate, norm drs, frt all'd	lb.	.14½	.168	.14½	.168	.10	.168
tks, frt all'd	lb.	.13½	.158	.13½	.158	.09	.158
Secondary, tks, frt all'd	lb.	...	.08½	...	.08½	.07¼	.08½
drs, frt all'd	lb.	...	.09½	...	.09½	.08¾	.09½
Aldehyde, 50 gal drs, wks	lb.	.14½	.16½	.14½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)							
Chloride, normal lcl, drs	lb.	...	.35	.28	.35	...	...
c-l, drs	lb.	...	.32	.25	.32	...	...
Crotonate, norm, 55 and 110 gal drs, delv	lb.	...	.35	...	.35	...	.35
Lactate	lb.	...	.26½	...	.26½	...	.23½
Oleate, drs, frt all'd	lb.	...	.25	...	.25	...	.25
Propionate, drs	lb.	.16½	.17	.16½	.17	.16½	.17
tks, delv	lb.	...	.15½	...	.15½	...	.15½
Stearate, 50 gal drs	lb.	...	.31	...	.31	.28½	.32½
Tartrate, drs	lb.	no prices		no prices		.55	.60
Butyraldehyde, drs, lcl, wks	lb.	...	.35½	...	.35½	...	.35½
C							
Cadmium Metal (*PC*)	lb.	.90	.95	.90	.95	.80	.95
Sulfide, orange, boxes	lb.	...	1.10	...	1.10	...	1.10
Calcium, Acetate, 150 lb bgs c-l, delv	100 lb.	3.00	4.00	3.00	4.00	1.90	4.00
Arsenate, c-l, E of Rockies, dealers, drs	lb.	.07	.08	.06½	.08	.06	.07½
Carbide, drs	lb.	...	.04¾	...	.04¾	...	.04¾
Carbonate, tech, 100 lb bgs, c-l	ton	16.00	20.00	16.00	20.00	16.00	20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv	ton	...	21.00	...	21.00	...	20.50
paper bgs, c-l, delv	ton	18.50	41.00	18.50	41.00	18.50	35.00
Solid, 650 lb drs, c-l, delv	ton	18.00	34.50	18.00	34.50	18.00	34.50
Ferrocyanide, 350 lb bbls wks	lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls	lb.	.52	.59	.52	.59	.52	.59
Levulinate, less than 25 bbl lots, wks	lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs	ton	no prices		no prices		no prices	
Palmitate, bbls	lb.	.28	.29	.28	.29	.22	.29
Phosphate, tribasic, tech, 450 lb bbls	lb.	.0635	.0705	.0635	.0705	.0635	.0705
Resinate, precip, bbls	lb.	.15	.16	.13	.16	.13	.14
Stearate, 100 lb bbls	lb.	.26	.27	.26	.27	.20½	.27
Camphor, slabs	lb.	1.60	1.65	1.60	1.65	.73	1.65
Powder	lb.	1.60	1.65	1.60	1.65	.63	1.65
Carbon Bisulfide, 500 lb drs	lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, f.o.b. plants	lb.	...	.03625	...	.03625	.03325	.0342
Decolorizing, drs, c-l	lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq, 20-25 lb cyl	lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, (*FP*) (*PC*) 55 or 110 gal drs, c-l, delv	gal.	...	.73	...	.73	.66½	.73
Casein, Standard, Dom, grd	lb.	...	.18½	.15	.30½	.11½	.31
80-100 mesh,c-l bgs	lb.	...	.19	.15½	.31	.12	.31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks (*PC*)	ton	...	19.00	16.00	19.00	15.00	16.00
Imported, ship, bgs	ton	no prices		no prices		no prices	
Celluloid, Scraps, ivory cs	lb.	.13	.15	.13	.15	.12	.15
Transparent, cs	lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, frt all'd, 50 lb kgs	lb.	...	.30	...	.30	...	.30
Triacetate, flake, frt all'd	lb.	...	.30	...	.30	...	.30
Chalk, dropped, 175 lb bbls	lb.	...	.02½	...	.02¼	.02¾	.02½
Precip, heavy, 560 lb cks	100 lbs.	...	32.50	32.50	32.50	32.50	32.50
Charcoal, Hardwood, lump, blk, wks	bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv*	ton	27.50	38.50	25.00	38.50	25.00	36.00
Willow, powd, 100 lb bbls, wks	lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified tks, wks	lb.	.	.0225	...	.0225	.01¾	.0275
25%, bbls, wks	lb.	...	.0275	...	.0275	.0240	.0275
China Clay, c-l, blk mines	ton		7.60		7.60		7.60
Imported, lump, blk	ton	19.00	24.00	18.60	24.00	18.60	...
Chlorine, cyls, lcl, wks, contract (*FP*) (A)	lb.	...	.07¼	...	.07¼	...	.07¼
cyls, c-l, contract	lb. *j*	...	.05¼	...	.05¼	...	.05¼
Liq, tk, wks, contract	100 lb.	...	1.75	...	1.75	...	1.75
Multi, c-l, cyls, wks, cont	lb.	...	2.00	...	2.00	1.90	2.00
Chloroacetophenone, tins, wks	lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks	lb.	...	.08	...	.08	.06	.08
Chloroform, tech, 650 lb drs	lb.	...	.20	...	.20	...	.20
USP, 650 lb drs	lb.	...	.30	...	.30	...	.30
Chloropicrin, commi cyls	lb.	...	.80	...	.80	...	.80
Chrome, Green, CP	lb.	.23	.33	.23	.33	.21	.25
Yellow	lb.	.16	.17	.16	.17	.13½	.14½
Chromium Acetate, 8% Chrome, bbls	lb.	.07¾	.08½	.07¾	.08½	.07¾	.08½
Fluoride, powd, 400 lb bbls	lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls	bbl.	8.25	9.25	7.50	9.25	7.50	7.75
Cobalt Acetate, bbls (A)	lb.	...	.83¾	...	.83¾	.80½	.83¾
Carbonate tech, bbls (A)	lb.	...	1.58	...	1.58	...	1.58
Hydrate, bbls (A)	lb.	...	2.04	...	2.04	1.98	2.04
Linoleate, solid, bbls	lb.	...	.44	.42	.44	.33	.42
paste, 5%, drs	lb.	.32	.35	.31	.35	...	.31
Oxide, black, bgs (A)	lb.	...	1.84	...	1.84	...	1.84
Resinate, fused, bbls	lb.	...	.15	.13½	.15	...	.13½
Precipitated, bbls	lb.	...	.38	.34	.38	...	.34
Cochineal, gray or bk bgs	lb.	.37	.38	.37	.38	.37	.38
Teneriffe silver, bgs	lb.	.38	.39	.38	.39	.38	.39
Copper, metal *FP*, *PC*	100 lb.	12.00	12.50	12.00	12.50	12.00	12.50
Acetate, normal, bbls, delv	lb.	.24	.26	.24	.26	.22	.26
Carbonate, 52-54% 400 lb bbls	lb.	.18	.20½	.18	.20½	.1650	.20½
Chloride, 250 lb bbls	lb.	...	.23¼	.19½	.23¼	.16	.19½
Cyanide, 100 lb drs	lb.	.34	.38	.34	.38	.34	.38
Oleate, precip, bbls	lb.	.22	.29½	.20	.29½	...	.20
Oxide, black, bbls, wks	lb.	.19½	.21	.19½	.21	.18	.21
red 100 lb bbls	lb.	.20	.22	.20	.22	.19	.22
Sub-acetate verdigris, 400 lb bbls	lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks, 100 lb.		5.15	5.50	5.15	5.50	4.75	5.50
Copperas crys and sugar bulk c-l, wks	ton	...	17.00	...	17.00	14.00	17.00
Corn sugar, tanners, bbls	100 lb.	...	3.54	3.54	4.05	3.36	4.05
Corn Syrup, 42°, bbls	100 lb.	...	3.69	3.52	3.69	3.42	3.52
43°, bbls	100 lb.	...	3.74	3.57	3.74	3.47	3.57
Cotton, Soluble, wet 100 lb bbls	lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls	lb.	...	.57½	...	.57½	.38¼	.57½
Creosote, USP 42 lb cbys	lb.	.60	.77	.60	.77	.45	.77
Oil, Grade 1 tks	gal.	...	.15½	...	.15½	.13½	.15½
Grade 2	gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs, c-l (A)	lb.	.10¾	.11¼	.10¾	.11½	.09¾	.11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks	lb.	...	.15	...	.15	.11	.15
Cutch, Philippine, 100 lb bale	lb	no supplies		...	.05¼	.04¾	.05¼
Cyanamid, pulv, bgs, c-l, frt (A) all'd, nitrogen basis, unit		1.52½ nom.		no prices		...	1.40
D							
Derris root 5% rotenone, bbls	lb.	...	.35	.40	.45	.21	.40
Dextrin, corn, 140 lb bgs f.o.b., Chicago	100 lb.	...	4.00	...	4.00	3.80	4.00
British Gum, bgs	100 lb.	...	4.25	...	4.25	4.05	4.25
Potato, Yellow, 220 lb bgs	lb.	...	.10	.09½	.10	.08	.08½
White, 220 lb bgs, lcl	lb.	.09½	.11¾	.09½	.11¾	.08½	.09
Tapioca, 200 bgs, lcl	lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs	100 lb.	...	3.95	...	3.95	3.75	3.95
Diamylamine, c-l, drs, wks	lb.	...	.61	.50	.61	.47	.50
lcl drs, wks	lb.	...	.64	.53	.64	.48	.53
Diamylene, drs, wks	lb.	...	.105	...	.105	.095	.105
lcl, drs	lb.	...	.112	...	.112	...	...
tks, wks	lb.	...	.09½	...	.09½	.08¾	.09½
Diamylether	lb.	...	...	...	...	.085	.102
lcl, drs	lb.	...	.112	.102	.112	...	...
c-l, drs	lb.	...	.105	.095	.105	...	...
tks	lb.	...	.095	.085	.095	...	...
Diamylnaphthalene, lcl, drs, f.o.b. wks	lb.	...	.17	...	.17	.17	.20
Diamylphenol, lcl, drs	lb.	...	.21	...	.21	...	...
Diamylphthalate, drs, wks	lb.	...	.22	.21	.22	.21	.21¼
Diamyl Sulfide, drs, lcl	lb.	...	.25	...	.25	...	...
Diatomaceous Earth, see Kieselguhr.							
Dibutoxy Ethyl Phthalate, drs, wks	lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks	lb.	...	.64	.53	.64	...	.53
c-l, drs, wks	lb.	...	.61	.50	.61	...	.50
tks, wks	lb.	...	.59	.48	.59	...	.48
Dibutyl Ether, drs, wks, lcl	lb.	.26	.28	.26	.28	.25	.28
Dibutylphthalate, drs, wks, frt all'd	lb.	.21	.23½	.21	.23½	.19	.20
Dibutyltartrate, 50 gal drs	lb.	...	.92	.87	.92	.50	.87
Dichlorethylene, drs	lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks	lb.	.15	.16	.15	.16	.15	.16
tks, wks	lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks	lb.	...	.23	...	.23	...	.23
Dichloropentanes, c-l, drs	lb.	...	.037	...	.037	.025	.04
lcl, drs	lb.	...	.045	...	.045	...	...
tks, wks	lb.	...	.03	...	.03	.0221	.025

j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority. (*PC*) Price Ceiling.
(A) Allocation

* These prices were on a delivered basis.

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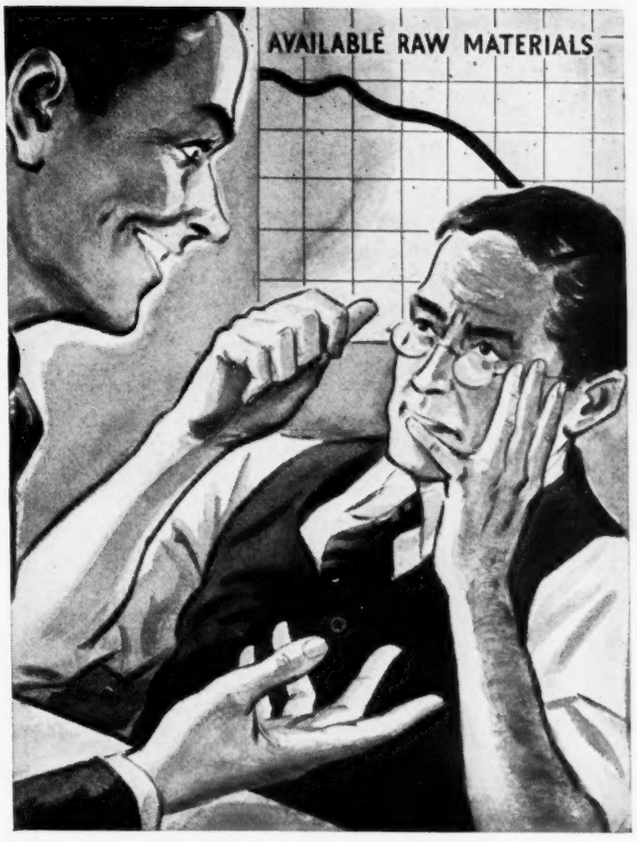
		Current Market	1942 Low	1942 High	1941 Low	1941 High
Diethanolamine, tks ,wks	lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks	lb.	...	.81	.70	.81	...	.70
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss	lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs	lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs	lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs	lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs	lb.	...	.22	.21½	.22	.19	.20
Diethylsulfate, tech, drs, wks, lcl	lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs	lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs	lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks	lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs	lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks	lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks	lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls	lb.	.31	.33	.16	.33	...	.16
Oleate, bbls	lb.	...	.17	...	.17	...	.17
Stearate, bbls	lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis	lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs	lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd	lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs	lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls	lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls	lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls	lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls	lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls	lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls	lb.	...	.15	...	.15	.15	.20
Diphenylamine (A)	lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs	lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.							
Divi Divi pods, bgs shipmt	ton	...	80.00	55.00	80.00	32.00	52.00
Extract	lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).							
E							
Egg Yolk, dom., 200 lb. cases	lb.	.87	.92	.87	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY	100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls	100 lb.	...	2.00	2.00	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs	lb.	.60	.61	.52	.61	.26	.53
Isopropyl 50 gal drs	lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd	lb.	...	.06	...	.06	...	.06
Nitrous conc bottles	lb.	.93	1.10	.73	1.10	...	.73
Synthetic, wks, tks	lb.	...	.12½	.08	.12½	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd	lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd	lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd	lb.	.11¼	.12¼	.11¼	.12¼	.06¾	.12¼
drs, frt all'd	lb.	.12¼	.13¼	.12¼	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs	lb.	...	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs	lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs	lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd	lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs	lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys	lb.	...	.30	...	.30	...	.30
Crotonate, drs	lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd	lb.	...	.27½	...	.27½	.25	.27½
Lactate, drs, wks	lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks	lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks	lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs	lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont	lb.	.75	.85	.75	.85	.75	.85
Anhydrous	lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies	lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks	lb.	...	.15½	.14½	.18½	.14½	.18½
tks, wks	lb.	...	.14½	.13½	.14½	...	.13½
Mono Butyl Ether, drs, wks	lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks	lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks	lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks	lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks	lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks	lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks	lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks	lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl	lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline	lb.	.45	.47½	.45	.47½	.45	.47½
F							
Feldspar, blk pottery	ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks	ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls	lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys	lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher
FP Full Priority. *PC* Price Ceiling. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks (*PC*) unit *l*	...	4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis unit *m*	nominal	2.75	3.25	2.75	3.25
Fluorspar, 98% bgs (*PC*) ton	28.00	28.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP*, *PC*) lb.	.055	.055	.0575	...	...
Fossil Flour lb.	.02½	.02½	.04	.02½	.04¼
Fullers Earth, blk, mines ton	8.50	8.50	15.00	8.50	15.00
Imp powd, c-l, bgs ton	30.00	30.00	40.00	no prices	
Furfural (tech) drs, wks lb.	.15	.15	.20	.10	.15
tks, wks lb.	...	...	.09	...	.09
Furfuramide (tech) 100 lb drs lb.	...	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18	.18	.18½	.16	.19½
Fustic, crystals, 100 lb boxes lb.	.28	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½	.12½	.16	.10½	.16
Solid, 50 lb boxes lb.	.19	.19	.21	.19	.21
G					
G Salt paste, 360 lb bbls lb.	...	...	.45	...	.45
Gambier, com 200 lb bgs lb.	no prices	...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs 100 lb.	.30 nom.	.12½	.30	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks 100 lb.	1.05	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate					
Glue, bone, com grades, c-l bgs lb.	.15½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19	.19	.30	.15	.30
Glycerin (*PC*) CP, drs lb.	...	.18¼	...	.14½	.19½
Dynamite, 100 lb drs lb.	...	.18¼	...	...	.18¼
Saponification, drs lb.	...	.12¾	...	.09½	.20½
Soap Lye, drs lb.	...	.11½	...	.07⅞	.18
Glyceryl Bori-Borate, bbls lb.	...	.40	...	...	.40
Monoricinoleate, bbls lb.	...	.27	...	...	.27
Monostearate, bbls lb.	...	.30	...	...	.30
Oleate, bbls lb.	...	.22	...	...	.22
Phthalate lb.	...	.38	...	...	.38
Glyceryl Stearate, bbls lb.	...	.18	...	...	.18
Glycol Bori-Borate, bbls lb.	...	.22	...	...	.22
Phthalate, drs lb.	...	.38	...	...	.38
Stearate, drs lb.	...	.26	...	...	.26
GUMS					
Gum Aloes, Barbadoes lb.	.80	.80	.85	.80	.95
Arabic, amber sorts lb.	.19	.18½	.24	.14	.25
White sorts, No. 1, bgs lb.	.33	.33	.35	.35	.45
Powd, bbls lb.	.22	.22	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY lb.	.04½	.04½	.12	.04½	.05½
California, f.o.b. NY, drs ton	35.00	20.00	40.00	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY lb.	.12	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases lb.	.50	.45	.55	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque lb.	...	.49½	...	.49½	...	.49½
Dark amber lb.	...	.12¾	...	.12¾	...	.12¾
Light amber lb.	...	.17	...	.17	...	.17
Copal, East India, 180 lb bgs						
Macassar pale bold lb.	...	.17¾	...	.17¾	.12¾	.17¾
Chips lb.	...	.11½	...	.11½	.06¾	.11½
Dust lb.	...	.07	...	.07	.05¼	.07
Nubs lb.	...	.13¾	...	.13¾	.10½	.13¾
Singapore, Bold lb.	...	.22⅜	...	.22⅜	.15¾	.22⅜
Chips lb.	...	.12⅜	...	.12⅜	.08½	.12⅜
Dust lb.	...	.07	...	.07	.05¼	.07
Nubs lb.	...	.17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb. (A)	...	.14½	.14	.14½	.13⅞	.14
Loba B lb.	...	.13¾	.13¾	.14¼	.11¾	.14¼
Loba C lb.	...	.13⅜	.13⅜	.13⅞	.11¼	.13⅞
DBB lb.	...	.11	.11	.12¼	.10	.12¼
MA sorts lb.	...	.09¾	.09¾	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold gen. (A) lb.	...	.22⅜	.22⅜	.22⅞	.15⅜	.22⅞
Chips lb.	...	.12⅜	.12⅜	.14½	.10	.14½
Mixed lb.	...	.17⅜	.17⅜	.17⅞	.14⅜	.17⅞
Nubs lb.	...	.18⅜	.18⅜	.18⅞	.12¾	.18⅞
Split lb.	...	.19⅛	.19⅛	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases (A)						
A lb.	...	.35¼	...	.35¼	.21½	.35¼
B lb.	...	.34⅜	...	.34⅜	.20¼	.34⅜
C lb.	...	.28⅝	...	.28⅝	.14⅝	.28⅝
D lb.	...	.25⅝	...	.25⅝	.13¼	.25⅝
A/D lb.	...	.28⅜	...	.28⅜	.15¼	.28⅜
A/E lb.	...	.25⅝	...	.25⅝	.12⅞	.25⅝
E lb.	...	.18¾	...	.18¾	.10	.18¾
F lb.	...	.13¾	...	.13¾	.08	.13¾
Singapore, No. 1 lb.	...	.30⅝	...	.30⅝	.16⅝	.30⅝
No. 2 lb.	...	.25⅜	...	.25⅜	.12¼	.25⅜
No. 3 lb.	...	.12⅜	...	.12⅜	.07⅛	.12⅜
Chips lb.	...	.23½	...	.23½	.11	.23½
Dust lb.	...	.13	...	.13	.07½	.13
Seeds lb.	...	.17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l (A) lb.	...	.08⅞	...	.08⅞	.08½	.08⅞
Ester lb.	...	.09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases lb.	2.30	2.35	.95	2.35	.95	1.00
Powd, bbls lb.	2.50	2.55	1.05	2.55	1.05	1.10
Ghatti, sol, bgs lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs lb.	.14	.33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling. (A) Allocation



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Kauri, NY
Logwood

Prices

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Kauri, N Y (A)						
Brown XXX, cases	lb.	...	.77	.60	.77	...	.60
BX	lb.	...	.38	...	.38	...	.38
B1	lb.	...	.34	.28	.34	...	.28
B2	lb.	...	.30	.24	.30	...	.24
B3	lb.	...	.27½	.18½	.27½	...	.18½
Pale XXX	lb.	...	.66	.61	.66	...	.61
No. 1	lb.	...	.43	.41	.43	...	.41
No. 2	lb.	...	.31	.24	.31	...	.24
No. 3	lb.	...	.22	.17¾	.22	...	.17¾
Kino, tins	lb.	no prices		no prices		no prices	
Mastic	lb.	3.25	3.30	3.25	3.30	1.50	3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	.95	.97½	.95	1.10	.50	1.10
Senegal, picked bgs	lb.	...	.30	...	.30	...	.30
Sorts	lb.	...	.13	...	.13	...	.13
Thus, bbls	280 lbs.	...	16.50	...	16.50	15.00	16.50
Tragacanth, No. 1, cases	lb.	3.75	4.00	3.50	4.00	2.75	3.40
No. 2	lb.	2.00	3.00	2.00	3.00	2.45	2.80
No. 3	lb.	1.10	1.20	1.10	1.20	1.10	2.60
Yacca, bgs (*PC*)	lb.	.06	.07½	.06	.07¾	.03½	.07¾
H							
Hematine crys, 400 lb bbls	lb.	.24	.34	.24	.34	.20	.34
Hemlock, 25%, 600 lb bbls							
wks	lb.	...	.0385	.03½	.0385	.03¼	.03½
tks	lb.	...	.0325	.03	.0325	.02¾	.03
Hexalene, 50 gal drs, wks	lb.	...	.23	...	.23	.23	.30
Hexane, normal 60-70° C. Group 3, tks (*PC*)	gal.	...	.11	...	.11	.09¾	.11
Hexamethylenetetramine, powd, drs (*FP*)	lb.	.32	.33	.32	.33	.32	.33
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit		4.00	4.50	3.00	4.50	2.65	3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.16	.18½	.16	.18½	.16	.18½
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, Bags, No. 1	lb.	...	.42	...	.42	.40	.42
I							
Indigo, Bengal, bbls	lb.	2.14	2.20	2.14	2.20	1.63	2.20
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars	lb.	...	2.00	...	2.00	...	2.00
Irish Moss, ord, bales	lb.	.37	.42½	.30	.42½	.25	.31
Bleached, prime, bales	lb.	.80	.85	.80	.85	.32	.46
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride							
Nitrate, coml, bbls	100 lb.	3.50	4.00	3.50	4.00	3.50	4.00
Isobutyl Carbinol (128-132°C) drs, f.o.b. Wyandotte, Mich.	lb.	...	.23½	...	.23½	.22½	.23½
tks,	lb.	...	.21½	...	.21½	...	.21½
Isopropyl Acetate, tks, frt all'd	lb.	...	.10	.076	.10	.06½	.07½
drs, frt all'd, c-l	lb.	...	.12	.086	.12	.07½	.08½
Ether, see Ether, isopropyl							
K							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	25.00	22.00	25.00	22.00	25.00
L							
Lead Acetate, f.o.b. NY, bbls, (*PC*) White, broken	lb.	...	.12½	.12	.13¼	.11	.12½
cryst, bbls	lb.	...	.12½	.12	.13¼	.11	.12½
gran, bbls	lb.	...	.13¼	.12¾	.14	.11¾	.13¼
powd, bbls	lb.	...	.13¼	.12¾	.14	.11¾	.13¼
Arsenate, East, drs	lb.	.11	.12	.11	.12	.09	.11
Linoleate, solid, bbls	lb.	...	.22½	.19	.22½	...	.19
Metal, c-l, NY (*FP*)	100 lb.	5.85	5.90	5.85	5.90	5.70	5.90
Nitrate, 500 lb bbls, wks	lb.	.11	.14	.11	.14	.11	.14
Oleate, bbls	lb.	...	.17¾	.17¾	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv	lb.	...	.09	..	09	.08	.08¼
97% Pb_3O_4, delv	lb.	...	.09½	.09¼	.09½	.084	.086
98% Pb_3O_4, delv	lb.	...	.10½	.09½	.10½	.0865	.0885
Resinate, fused, bbls	lb.	.10	.12	.09½	.12	.09½	.16½
Stearate, bbls	lb.	..	.25	...	.25	...	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	...	.10¼	...	.10¼	...	.10¼
White, 500 lb bbls, wks,	lb.	...	.07½	...	.07½	...	.07½
Basic sulfate, 500 lb bbls, wks	lb.	...	.07½	.06¾14	.07½	.06¾	.07
Lecithin, ed, dms, cl	lb.	...	.34	...	...	...	...
tech, dms, cl	lb.	...	.28	...	...	...	...
Lime, chemical quicklime, f.o.b. wks, bulk	ton	7.00	13.00	7.00	13.00	7.00	13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	16.00
Lime Salts, see Calcium Salts							
Lime, sulfur, dealers, tks	gal.	no prices		.07½	.08½	...	.07½
drs	gal.	no prices		.10	.14	.10	.14
Linseed Meal, bgs	ton	...	34.00	33.50	34.00	23.00	33.00
Litharge, coml, delv, bbls	lb.	...	.08	.079	.08	.07	.0760
Lithopone, dom, ordinary, (*PC*). delv, bgs	lb.	...	.04¼	...	.04¼	.0385	.04¼
bbls	lb.	...	.04½	...	.04½	.041	.04½
Titanated, bgs	lb.	...	.056	...	.056	.05¼	.056
bbls	lb.	...	.0585	...	.0585	.05½	.0585
Logwood, 51°, 600 lb bbls	lb.	...	.13	...	.13	.10½	.13
Solid, 50 lb boxes	lb.		.22		.22	.16½	.22

(*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
M					
Madder, Dutch ..... lb.	.24	.30	.22	.30	.22	.25
Magnesite, calc, 500 lb bbls ton	83.00	88.00	74.00	88.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks ..... lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ..... ton	...	32.00	...	32.00	...	32.00
Metal, Ingots, c-l ..... lb.	...	.27	...	.27	...	
Oxide, calc tech, heavy bbls, frt all'd ..... lb.	...	.26	...	.26	...	.26
Light bbls above basis lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis ..... lb.	...	.26	...	.26		.26
Palmitate, bbls ..... lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls .... lb.	.18	.20	.18	.25	.11	.25
Stearate, bbls ..... lb.	.31	.32	.31	.33	.23	.31
Manganese, acetate, drs ... lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.17	.15	.17	.15	.16
Chloride, bbls ..... lb.	...	.13	.13	.14	...	.14
Dioxide, tech (peroxide), paper bgs, c-l ..... ton	...	74.75	70.00	74.75	...	71.50
Hydrate, bbls ..... lb.	...	.82	...	.82	...	.82
Linoleate, liq. drs ..... lb.	...	.20	.18	.20	.18	.19½
solid, precip, bbls ... lb.	...	.22	.19	.22	...	.19
Resinate, fused bbls ... lb.	.09	.10½	.08¼	.10½	.08¼	.08½
precip, drs ..... lb.	.14½	.15½	.12	.15½	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs .... lb.	...	.11¼	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ..... ton	no prices		no prices		34.00	38.00
Mannitol, pure cryst, cs, wks lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls ..... lb.	...	.40	...	.40	.35	.45
Marble Flour, blk ..... ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel) lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal ..76 lb. flasks	191.00	193.00	191.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks ..... lb.	...	.10½	...	.10½	.10½	.15
drs, c-l ..... lb.	...	.12½	.11½	.12½	.11½	.16
drs, lcl ..... lb.	...	.13	.12	.13	.12	.16½
Meta-nitro-aniline ..... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ..... lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls ..... lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ..... lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd. drs, c-l frt all'd (*PC*) gal.	...	.66	...	.66	.60	.66
tks, frt all'd ..... gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd ..... gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat ..... gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs .... gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth ..... gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv ..... lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ..... lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv ..... lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd ..... gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs ..... gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd ...gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone ..... lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ..... lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd ..... lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks ..... lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl .... lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd ...lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ...lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks ..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ....lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks ..... lb.	...	.16	...	.16	.16	.19
crude ..... lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs, wks lb.	...	.61	.50	.61	.50	.52
lcl, drs, wks on (100% basis) ..... lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks ..... lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs (100% basis) c-l, wks ..... lb.	...	.48	.40	.48	...	.40
l-c-l, wks ..... lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ..... lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ..... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks ..... lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.

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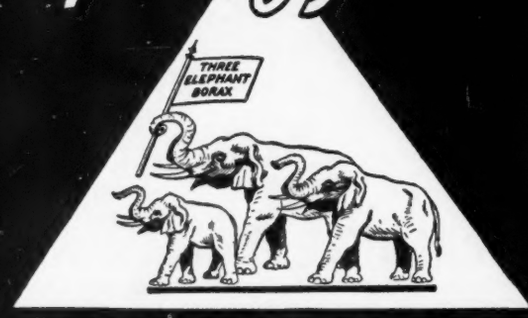

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Myrobalans
Para Toluidine

Prices

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices
J1 bgs ton	no prices		no prices	35.00	48.00
J2 bgs ton	no prices		no prices	28.00	39.00
N					
Naphtha, v.m.&p. (deodorized) see petroleum solvents.					
Naphtha, Solvent, water-white, tks gal.	...	.27	...	.27	...	.26
drs, c-l gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks lb.	2.75	3.00	2.50	3.00	2.25	2.75
Balls, flakes, pks lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls (A) lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks lb.	.08	.09	.08	.09	.08	.09
tks lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks unit	...	3.00	2.75	3.50	2.20	3.00
dom, Western wks unit		2.50	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	.0385	...	.03½	.03¾	.03⅛	.03¾
tks lb.	...	.0325	.02	.0325	.02¾	.03
Octyl Acetate, tks, wks lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY lb.	...	.12	...	.12	.11	.11½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks (A) lb.	.17	.17½	.17	.17½	.16	.17½
Orthodichlorobenzene, 1000 lb drs lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.16	.15	.18	.15	.18
Orthonitroparachlorphenol, tins lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*) 122-127° M P lb.	...	.052	...	.052	.04¼	.057
128-132° M P lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls lb.	...	.70	...	.70	...	.70
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.24	.26	.23	.25
Pentane, normal, 28-38° C, group, 3 tks (*PC*) ..gal.	...	.06½	.06½	.08½	... .08½
drs, group 3 .....gal.	...	.11	.11½	.16	.11½ .16
Perchlorethylene, 10 lb drs, frt all'd (*FP*) .....lb.	.08	.08½	.08	.08½	.08 .08½
Petrolatum, dark amber, bbls .....lb.	...	.03¾	...	.03¾	.02¾ .03½
White, lily, bbls .....lb.	...	.05¾	...	.05¾	.04¾ .05¾
White, snow, bbls .....lb.	...	.06½	...	.06½	.05½ .06½
Petroleum Ether, 30-60°, group 3, tks .....gal.	...	.16	...	.16	.13½ .16
drs, group 3 .....gal.	...	.18	...	.18	.14½ .18

PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks .....gal.	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	.11	.10½	.11	.10	.10½
Lacquer diluents, tks East Coast .....gal.	...	.11	...	.11	.09½	.11
Group 3, tks .....gal.	.07⅜	.07½	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East tks, wks .....gal.	...	.11	.10½	.11	.09	.11
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Petroleum thinner, 43-47, East, tks, wks .....gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks ...gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks ..gal.	...	.11	.10½	.11	.09½	.10½
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Stoddard Solvents, East, tks, wks .....gal.	...	.09½	...	.09½	.083	.09½
Group 3, wks .....gal.	...	.06⅝	...	.06⅝	.05½	.06⅝
Phenol, 250-100 lb drs ....lb.	...	.12½	.12½	.13	.12	.13¾
tks, wks (*FP*) (A) ....lb.	...	.11½	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs .....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com .....lb.	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons .....lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis .....ton	...	2.70	2.40	2.70	2.15	2.40
72% basis .....ton	...	3.20	3.00	3.20	2.50	3.00
Florida Pebble, 68% basis ton	...	2.20	2.00	2.20	1.90	2.00
75-74% basis .....ton	...	4.00	...	4.00	...	2.90
Tennessee, 72% basis ..ton	...	5.50	5.00	5.50	4.50	5.00
Phosphorus Oxychloride 175 lb. cyl (*FP*) .....lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases .....lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs .lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl .....lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks (A) .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist .....lb.	.72	.74	.72	.74	.50	.65
Steam dist wat wh bbls gal.	1.00	nom	1.00	1.10	.59	.68
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ....ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported .....lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls .....bbl.	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, 1-c-l, drs, f.o.b. wks .....lb.	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol ..lb	.06¼	.06¼	.06¼	.06¼	.06¼	.06¼
flake .....lb.	...	.07	...	.07	...	.07
liquid, tks .....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, Dom 30% basis, blk .....unit	...	.60	...	.60	...	.60

POTASSIUM

Potassium Abietate, bbls ..lb.	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb bbls .....lb.	.19	.21	.14	.21	.14	.17
Bichromate Crystals, 725 lb cks *(*FP*) .....lb.	...	.09⅝	...	.09⅝	.08⅞	.09⅝
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks .....lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks .....lb.	...	.0275	...	.0275	...	.0275
drs, wks .....lb.	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs, wks (*FP*) (A) .....lb.	nom.	.11	nom.	.11	...	.11
gran, kgs .....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs .....lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls ....lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) ...lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs .....lb.	...	.55	...	.55	...	.55
Iodide, 250 lb bbls .....lb.	1.44	1.48	1.44	1.48	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls .....lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs, wks (FP) (A) .....lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ⅛c higher.
(*FP*) Full Priority. (*PC*) Price Control. (A) Allocation

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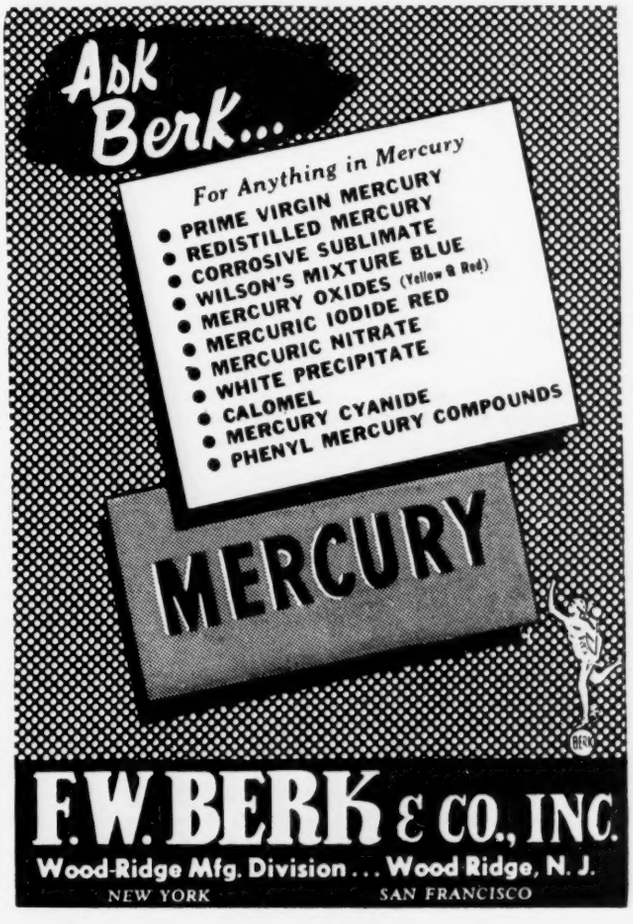

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Potassium Permanganate
Schaeffer's Salt

Prices

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):					
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) lb.	.20½	.21	.19¼	.21	.19¼	.21
Prussiate, red, bbls lb.	no prices		no prices		no prices	
Yellow, bbls lb.	.17	.19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls lb.	...	.45	...	.45	...	.40
Pot & Mag Sulfate, 48% basis bgs ton	...	26.00	...	26.00	26.00	27.00
Propane, group 3, tks (*PC*) lb.	.02¾	.03¼	.02¾	.03¼	.03¼	.04
Putty, com'l, tubs 100 lb.	...	3.15	...	3.15	...	3.15
Linseed Oil, kgs 100 lb.	...	5.00	...	5.00	...	5.00
Pyrethrum, conc liq: (A) 2.4% pyrethrins, drs, frt all'd gal.	...	5.75	4.30	5.75	4.40	4.95
3.6% pyrethrins, drs, frt all'd gal.	...	8.53	6.35	8.53	6.60	7.20
Flowers, coarse, bgs lb.	.27	.28	.21	.28	.20	.25
bgs lb.	...	.23	.22	.29	.21	.26
Fine powd, bbls lb.	...	1.71	...	1.71	...	1.71
Pyridine, denat, 50 gal drs gal.	...	.46	...	.46	...	.48
Refined, drs lb.	...					
Pyrites, Spanish cif Atlantic ports, blk unit	no prices		no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.40
Q						
Quebracho, 35% liq tks lb.	...	.05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l lb.	...	.05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif lb.	...	.04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales lb.	...	.05	...	.05	.05	.05¼
Quercitron, 41 deg liq, 450 lb. bbls lb.	...	.10	...	.10	.08½	.09½
Solid, drs lb.	...	.18½	.18	.18½	.11	.16½
R						
R Salt, 250 lb bbls, wks lb.	...	.55	...	.55	...	.55
Resorcinol, tech cans lb.	.68	.74	.68	.74	.68	.74
Rochelle Salt, cryst lb.	...	.43½	...	.43½	.32½	.43½
Powd, bbls lb.	...	.42½	...	.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	...	.51	.48	.51	.40	.50
Second run gal.	...	.53	.50	.53	.42	.56
Third run, drs gal.	...	.57	.54	.57	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**						
B	...	3.50	2.96	3.66	2.06	3.55
D	...	3.54	2.73	3.65	2.08	3.55
E	...	3.63	3.06	3.74	2.07	3.62
F	...	3.65	3.27	3.79	2.08	3.59
G	...	3.65	3.52	3.79	2.18	3.52
H	...	3.65	3.53	3.79	2.27	3.50
I	...	3.67	3.53	3.79	2.26	3.50
K	...	3.69	3.56	3.88	2.36	3.61
M	...	3.73	3.66	3.94	2.38	3.68
N	...	3.77	3.67	4.05	2.47	3.71
WG	...	3.81	3.69	4.81	2.79	4.52
WW	...	3.85	3.73	5.20	3.05	4.57
X	...	3.85	3.73	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**						
B	...	2.85	2.08	3.10	1.31	3.00
D	...	2.89	2.31	3.21	1.51	3.00
E	...	2.98	2.41	3.27	1.60	3.07
F	...	3.00	2.62	3.24	1.62	3.04
G	...	3.00	2.87	3.24	1.60	2.97
H	...	3.00	2.88	3.24	1.63	2.97
I	...	3.02	2.88	3.26	...	2.98
K	...	3.04	2.91	3.35	1.84	3.06
M	...	3.08	3.05	3.40	2.01	3.13
N	...	3.12	3.05	3.50	2.65	3.16
WG	...	3.16	3.06	4.26	2.76	3.97
WW	...	3.20	3.10	4.65	2.96	4.02
X	...	3.20	3.10	4.65	2.96	4.02
Rosin, Wood, c-l, FF grade, NY	1.70	2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines ton	25.00	37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls lb.	no prices		no prices		no prices	
Powdered, bbls lb.	no prices		no prices		no prices	
S						
Sago Flour, 150 lb bgs lb.	.05	.05¼	.04¾	.05¼	.03½	.05½
Sal Soda, bbls wks 100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ton	...	15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ton	...	16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls lb.	...	.082	...	.082	.076	.082
Cryst, bbls lb.	...	.092	...	.092	.086	.092
Powd, bbls lb.	...	.092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs lb.	...	.46	...	.46	...	.46

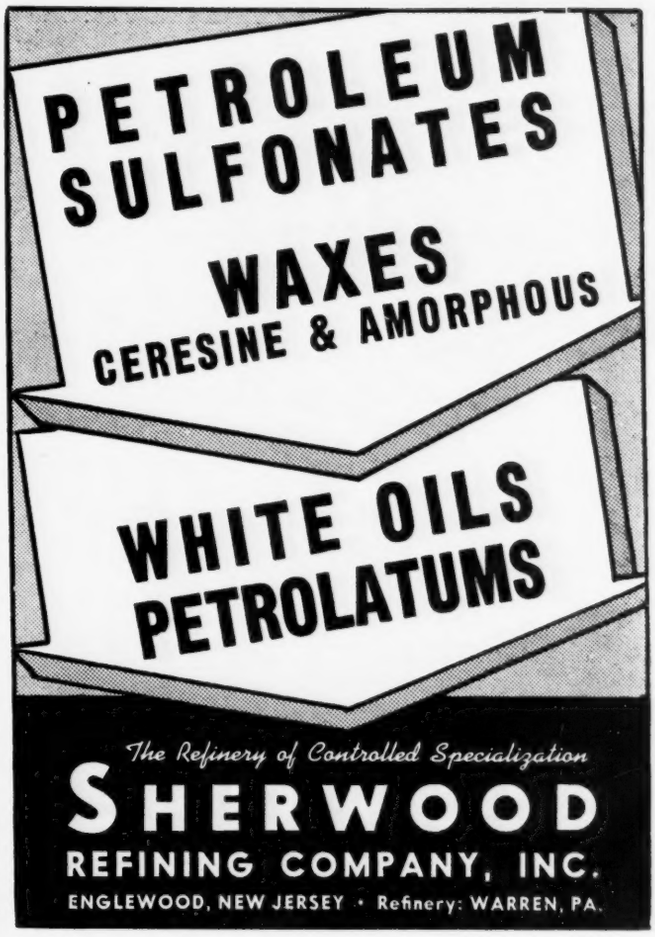
** Jan. 30, 1941, high and low based on 280 lb. unit. August 28 prices. *r* Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c. Philadelphia deliveries f.o.b. N. Y.. refined 6c higher in each case. (*FP*) **Full Priority.** (*PC*) **Price Ceiling.** (A) Allocation

Current

Shellac
Sodium Sulfite

	Current Market		1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls ..lb. ♯	.39	.40	.39	.40	.26	.40‡
Garnet, bgs .....lb.	.37	.39	.37	.39	.20	.39
Superfine, bgs .....lb. ♯	.32	.33	.32	.34	.16½	.34
T. N., bgs .....lb. ♯	.31	.32	.31	.33	.16	.33
Silver Nitrate, vials .....oz.	...	.26⅞	...	.26⅞	.24	.26⅞
Slate Flour, bgs, wks ....ton	11.00	12.00	9.00	12.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs ....100 lb.	1.05	1.13	1.05	1.13	1.05	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls .....100 lb.	...	1.35	...	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	2.00	...	2.00	...	2.00
SODIUM						
Sodium Abietate, drs .....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks .....lb.	...	.05	...	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv .....lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs .....lb.	...	.79	.69	.79	.39	.73
Antimoniate, bbls .....lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs .....lb.	...	.08	...	.08	.07	.08¼
Arsenite, liq, drs .....gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	...	.06¼	...	.06¼	.06½	.09¼
Benzoate, USP kgs ....lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.85	1.70	1.85	...	1.70
Bichromate, 500 lb cks, wks* (*FP*) .....lb.	...	.07⅛	...	.07⅛	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.35	1.80	1.35	1.80	1.40	1.80
Chlorate, bgs, wks (A) lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks .....lb.	...	.08	...	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks ..100 lb.	2.75	3.00	2.75	3.00	...	2.80
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	...	2.45	...	2.45	...	2.45
Iodide, Jars .....lb.	...	2.42	...	2.42	...	2.42
Metanilate, 150 lb bbls ..lb.	...	.40	...	.40	.41	nom.
Metasilicate, gran, c-l, wks .....100 lb.	...	2.50	...	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, c-l, drs .....100 lb.	...	4.00	...	4.00	3.75	4.00
wks, lcl, drs ...100 lb.	...	5.05	...	5.05	5.05	5.05
Monohydrated, bbls ....lb.	...	.03	.026	.03	.023	.026
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs. c-l, NY (A) ...ton	...	29.35	...	29.35	28.70	29.35
100 bgs, same basis ..ton	...	30.05	...	30.05	29.40	30.05
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	...	.06¾	....	.06¾	.06¾	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. .....lb.	...	.04½	.04½	.04¾	.04½	.04¾
hyd, flake, 300 lb bbls, cl, f.o.b. wks .....lb.	...	.0315	.03	.0315	.0285	.03
Perborate, drs, 400 lb ..lb.	...	.14¾	...	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks .....100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks .....100 lb.	...	2.90	2.90	3.05	2.45	3.05
bgs, wks .....100 lb.	...	2.70	2.70	2.85	2.25	2.85
Pieramate, 160 lb kgs ..lb.	...	.65	...	.65	...	.65
Prussiate, Yellow, 350 lb bbls, wks .....lb.	...	.11	...	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0528	.0610	.0528	.06	.0510	.0610
Sesquisilicate, drs, c-l, wks .....100 lb.	...	3.05	...	3.05	...	3.05
Silicate, 60°, 55 gal drs, wks .....100 lb.	...	1.70	...	1.70	...	1.70
40°, 55 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks .....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .....lb.	.09	.14½	.09	.15	.09¾	.15
Stannate, 100 lb drs ....lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls .....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks .....100 lb. ♯	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, c-l, wks .....lb.	...	.024	...	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks .....lb.	...	.0315	...	.0315	.03	.03¾
Sulfite, powd, 400 lb bbls wks .....lb.	...	.05¼	...	.05¼	...	.05¼

♯ T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. ♯ Bags 15c lower; * Feb. 28. (*PC*) Price Control. (A) Allocation. ‡ Add 3½c per lb. to cover marine and war risk insurance.



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		Current Market		1942 Low	1942 High	1941 Low	1941 High
Sodium (continued)							
Sulfocyanide, drs	lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls	lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)							
Tungstate, tech, crys, kgs	lb.	no prices		no prices		no prices	
Sorbitol, drs, wks	lb.	...	.17¾	...	.17¾	.14¾	.17¾
Spruce, Extract, ord, tks	lb.	...	.01½	.01¾	.01½	.01⅝	.01¾
Ordinary, bbls	lb.	...	.02⅛	.01¾	.02⅛	.01⅝	.01¾
Super spruce ext, tks	lb.	...	.01½	...	.01½	.01¾	.01½
Super spruce ext, bbls	lb.	...	.02	...	.02	.01⅞	.02
Super spruce ext, powd, bgs	lb.	...	.04½	.04	.04½	...	.04
Starch, Pearl, 140 lb bgs	100 lb.	...	3.10	...	3.10	2.90	3.10
Powd, 140 lb bgs	100 lb.	...	3.20	...	3.20	3.05	3.80
Potato, 200 lb bgs	lb.	...	.0637	.061	.0637	.04½	.0585
Imp, bgs	lb.	no prices		no prices		no prices	
Rice, 200 lb bbls	lb.	.09	.10	.09	.10	.07½	.09½
Sweet Potato, 240 lb bbls, f.o.b. plant	100 lb.	nom.	7.00	nom.	7.00	nom.	7.00
Wheat, thick, bgs	lb.	...	.05	...	.05	...	.05
Strontium, carbonate, 600 lb bbls, wks	lb.	no prices		no prices		no prices	
Nitrate, 600 lb bbls, NY	lb.	.07¾	.08¼	.07¾	.08¼	.07¾	.08¼
Sucrose, octa-acetate, den, grd, bbls, wks	lb.	...	.45	...	.45	...	.45
tech, bbls, wks	lb.	...	.40	...	.40	...	.40
SULFUR							
Sulfur, crude, f.o.b. mines	ton	...	16.00	...	16.00	.	16.00
Flour, com'l, bgs	100 lb.	1.65	1.95	1.65	1.95	1.40	1.95
bbls	100 lb.	1.95	2.50	1.95	2.50	1.95	2.50
Rubbermakers, bgs	100 lb.	...	2.05	...	2.05	...	2.05
bbls	100 lb.	...	2.35	...	2.35	...	2.35
Extra fine, bgs	100 lb.	...	2.35	...	2.35	...	2.35
Superfine, bgs	100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls	100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs	100 lb.	3.05	3.35	3.05	3.35	2.80	3.35
bbls	100 lb.	3.40	3.70	3.40	3.70	3.15	3.70
Roll, bgs	100 lb.	2.40	2.70	2.40	2.70	2.15	2.70
bbls	100 lb.	2.30	2.85	2.30	2.85	2.30	2.85
Sulfur Chloride, 700 lb drs, wks	lb.	.03	.08	.03	.08	.03	.08
Sulfur Dioxide, 150 lb cyl	lb.	.07	.08	.07	.09	.07	.09
Multiple units, wks	lb.	.04½	.06	.04½	.07	.04½	.07
tks, wks	lb.	.04	.06	.04	.06	.04	.06
Refrigeration, cyl, wks	lb.	.13	.21	.13	.40	.16	.40
Multiple units, wks	lb.	...	.06½	.06½	.10	.07½	.10
Sulfuryl Chloride	lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd	ton	no prices		no prices		no prices	
Extract, 42°, bbls	lb.	...	.08	.06¼	.08	.06	.08
Superphosphate, 16% bulk, wks	ton	10.10	10.74	10.10	10.80	8.50	10.00
Run of pile	ton	9.60	10.24	9.60	10.24	8.00	9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit	ton	...	.85	.80	.85	.68	.80
T							
Talc, Crude, 100 lb bgs, NY	ton	12.50	24.50	12.50	24.50	14.00	16.00
Ref'd 100 lb bgs, NY	ton	17.25	19.25	17.25	19.25	17.25	19.25
French, 220 lb bgs, NY	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Italian, 220 lb bgs to arr	ton	no prices		no prices		no prices	
Ref'd, white bgs, NY	ton	no prices		no prices		no prices	
Tankage, Grd, NY	unit u	...	4.60	4.25	4.85	2.35	4.10
Ungrd	unit u	...	4.96	5.25	5.70	2.35	5.10
Fert grade, f.o.b. Chgo	unit u	...	5.37	5.60	5.90	2.35	5.60
South American cif	unit u	...	nom.	5.05	5.60	2.60	4.75
Tapioca Flour, high grade, bgs	lb.	.04¾	.07¼	.04	.07¼	.03	.06¾
Tar Acid Oil, 15%, drs	gal.	...	.27½	...	.27½	.22	.24
25% drs (A)	gal.	...	.31½	...	.31½	.25	.27½
Tar, pine, delv, drs	gal.	...	.33	.32½	.33	.26	.29
tks, delv, E. cities	gal.	...	.24½	.24	.24½	...	.22
Tartar Emetic, tech, bbls	lb.	...	.47¾	...	.47¾	.36¼	.47¾
USP, bbls	lb.	.52¾	.53	.52¾	.53	.42	.53
Terpineol, den grade, drs	lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs	lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech	lb.	.08	.09	.08	.09	.08	.09
Tetralene, 50 gal drs, wks	lb.	...	.19	...	.19	.19	.21
Thiocarbanilid, 170 lb bbls	lb.	...	.24	...	.24	.	.24
Tin, crystals 500 lb bbls, wks	lb	.39	.39½	.39	.39½	.38	.40
Metal, NY (*PC*) (A)	lb.	...	.52	...	.52	.501	.52¾
Oxide, bbls, wks	lb.	...	.55	.55	.57	.54	.56
Tetrachloride, 100 lb drs, wks	lb.	no prices		no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls (*PC*)	lb.	...	.14½	...	.14½	.13¾	.14½
Barium Pigment, bbls	lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Calcium Pigment, bbls	lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls	lb.	.32	.45	.32	.45	.32	.45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls	lb.	.22	.26	.22	.26	.22	.26
20% solution, bbls	lb.	.175	.215	.175	.215	.175	.215
Toluidine, mixed, 900 lb drs, wks	lb.	...	.26	...	.26	...	.26
Toluol, drs, wks (*FP*) (A)	gal.	...	.33	...	.33	.32	.33
tks, frt all'd (*FP*)	gal.	...	.28	...	.28	.27	.28
Toner Lithol, red, bbls	lb.	.55	.60	.55	.60	.55	.60
Para, red, bbls	lb.	.70	.75	.70	.75	.70	.75
Toluidine, bgs	lb.	...	1.05	...	1.05	...	1.05
Triacetin, 50 gal drs, wks,	lb.	...	.26	...	.26	...	.26
Triamyl Borate, lcl, drs, wks,	lb.	...	.33	...	.33	.27	.33
Triamylamine, drs, lcl, wks, drs	lb.	..	1.01	...	1.01	...	1.01

(*FP*) Full Priority. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Tributylamine, lcl, drs, f.o.b. wks lb.	.	.81		.81	.	.81
Tributyl citrate, drs, frt all'd lb.	...	.34	.24	.34	.24	.26
Tributyl Phosphate, frt all'd lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	(*FP*)	.08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*) lb.	.25	.31	.25	.31	.22	.36½
Triethanolamine, 50 gal drs, wks lb.	...	.19	...	.19	...	.19
tks, wks lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks lb.	..	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls lb.	...	.30	...	.30	...	.30
Stearate bbls lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest. lb.	.54	.56	.54	.56	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi ... lb.	...	.85	..	.85	.85	1.00
Triphenylguanidine lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*) lb.	.31	.32	.31	.32	.33	.38
Tripoli, airfloated, bgs, wks ton	...	21.50	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls gal.	...	.74	.69¼	.82½	.45	.83
Savannah, bbls.* gal.	...	.55½	.55¼	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY gal.	...	.63	.61	.80	.35	.76
tks, delv E. cities gal.	...	.58	.56	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities gal.	.60	.65	.60	.70	.35	.65
tks, delv E. cities gal.	...	.55	.55	.58	...	...
U						
Urea, pure 112 lb cases lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points ton	no prices		no prices		no prices	
Dom f.o.b., wks ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis ton	...	121.58	...	121.58	...	121.58
V						
Valonia beard, 42%, tannin bgs ton	no prices		no prices		no prices	
Cups, 32% tannin bgs ton	no prices		no prices		no prices	
Extract, powd, 63% lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots lb.	...	2.00	2.00	2.60	...	2.60
Ex-guaiacol lb.	...	2.35	..	2.35	2.50	2.55
Ex-lignin lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs lb.	3.12	3.17	3.12	3.17	3.12	3.17
W						
Wattle Bark, bgs ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls lb.	.04475	.046	.04475	.0475	.03⅞	.05
Wax, Bayberry, bgs lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs lb.	...	.49	...	.49	.30	.47
Brazilian, bgs lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases lb.	.59	.60	.55	.60	.35	.52
Candelilla, bgs lb.	...	.38	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs lb.	.88	.89	.87	.89	.68	.88
No. 2, yellow, bgs lb.	.87	.88	.86	.88	.66	.85
No. 2, N. C., bgs lb.	.84	.85	.82	.85	.62	.79
No. 3, Chalky, bgs lb.	.77	.78	.75	.78	.55	.78
No. 3, N. C., bgs lb.	.78	.79	.77	.79	.58	.79
Ceresin, dom, bgs lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases lb.	.40	.45	.30	.45	.16½	.35
Montan, crude, bgs lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.26	.27	.24	.27	.24	.25
Cakes, cases lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs ton						
bgs, c-l, wks ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb	18.00	22.00	18.00	22.00	18.00	19.00
Gilders, bgs, c-l, wks ton	20.00	24.00	16.00	24.00	16.00	20.00
X						
Xylol, frt all'd, East 10° tks, wks gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Z						
Zein, bgs, 1000 lb lots, wks lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd lb.	...	.12	...	.12	...	.12
Carbonate tech, bbls, NY lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.	...	2.50	...	2.50	2.25	2.50

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Prices Current

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Zinc (continued)						
Cyanide, 100 lb drs	lb.	.33	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv	lb.	...	...	.1035	.09¼	.1035
Metal, high grade slabs, c-l, NY (*FP*) (*PC*) 1000 lb.	lb.	8.65	...	8.65	7.65	8.64
E. St. Louis 100 lb.	lb.	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks	lb.	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks	lb.	.07¼	...	.07¼	.06¾	.07¼
Palmitate, bbls	lb.	.32	.33	.33	.24½	.33
Resinate, fused, pale bbls	lb.	.11	.12	.10	.12	.10
Stearate, 50 lb bbls	lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks	lb.	...	.360	.360	.365	.315	.365
Flake, bbls	lb.	...	.410	.405	.410	.335	.405
Sulfide, 500 lb bbls, delv	lb.	...	.08½	.08	.08½	...	.08
bgs, delv (*PC*)	lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs	lb.	.24	.25	.24	.29	.03⅜	.07¾
Zirconium Oxide, crude, 70-75% grd, bbls, wks	ton	75.00 100.00		75.00 100.00		75.00 100.00	

Oils and Fats

Babassu, tks, futures	lb.	...	.111	no prices	...	.06
Castor, No. 3, 400 lb drs	lb.	...	.13¾	.12½ .13¾	.0180	.12½
(*PC*) Blown, 400 lb drs	lb.	...	.15¼	.14 .15¼	.11¾	.14
China Wood, drs, spot NY	lb.	...	.39	.39 .40⅛	.27¼	.37¼
Tks, spot NY	lb.	...	.3875	.3875 ...	.26¼	.35½
Coconut, edible, drs NY	lb.	...	.0985	... ...	.08	.15½
Manila, tks, NY	lb.	...	.0835	... ...	.03⅜	.10
Tks, Pacific Coast	lb.	no prices		no prices	...	.03¼
Cod, Newfoundland, 50 gal bbls	gal.	...	.90	.85 .90	.07½	.80
Copra, bgs, NY	lb.	no prices		no prices	.0180	.04¼
Corn, crude, tks, mills	lb.	.12¾ nom.		.12½ .12¾	.06⅝	.13
Refd, 375 lb bbls, NY	lb.	.15½ nom.		.15 .15½	.14¾	.16
Degras, American, 50 gal bbls, NY	lb.	.12½ nom.		.11½ .12½	.07½	.08¾
Greases, Yellow	lb.	...	.0929	... .0929	.04¾	.08½
White, choice, bbls, NY	lb.	...	.097	... .097	.05	.09
Lard, Oil, Edible, prime	lb.	...	.16	.15½ .16	.08½	.14½
Extra, bbls	lb.	...	.15¼	.15 .15¼	.08¼	.13¼
Extra, No. 1, bbls	lb.	...	.14½	.14½ .14½	.08	.13¼
Linseed, Raw less than 5 drs lots	lb.	...	.141	.125 .149	.091	.123
drs, c-l, spot	lb.	.133	.135	.117 .143	.095	.190
Tks	lb.	.124	.126	.108 .134	.084	.1060
Menhaden, tks, Baltimore	lb.	...	.089	.63¾ .666	.30	.60*
Refined, alkali, drs	lb.	.127	.129	.12 .129	.084	.122
Kettle boiled, drs	lb.	.137	.139	.13 .139	.096	.132
Light pressed, drs	lb.	.137	.139	.11 .139	.082	.112
Tks	lb.	.109	.11	.102 .11	.072	.10
Neatsfoot, CT, 20°, bbls, NY	lb.	nom.	.25¼	... .25¼	.18¼	.26½
Extra, bbls, NY	lb.	nom.	.14⅞	... .14⅞	.08¼	.14
Pure, bbls, NY	lb.	nom.	.19¼	.17¾ .19¼	.12¼	.17¾
Oiticica, bbls	lb.	.23	.25	.29 .25	.16½	.23½
Oleo, No. 1, bbls, NY	lb.	...	.13¼	... .13¼	.07⅜	.13¼
No. 2, bbls, NY	lb.	...	.13	... .13	.07⅜	.13
Olive, denat, bbls, NY	gal.	3.75	4.00	3.75 4.50	2.25	4.25
Edible, bbls, NY	gal.	4.10	4.25	4.10 5.50	4.75	5.30
Foots, bbls, NY	lb.	.19	...	.19 .20	.10¼	.19
Palm, Kernel, bulk	lb.	no prices		no prices	no prices	
Niger, cks	lb.	.0825	.0825	.0925 ...	.04¼	.09
Sumatra, tks	lb.	no prices		no prices	.02	.09
Peanut, tks, f.o.b. mill	lb.	.12⅞	.13	.12⅞ .13	.05¼	.16
Refined, bbls, NY	lb.	.17	nom.	.16¾ .17	.08	.16
Perilla, drs, N Y (A)	lb.	...	.246	... .246	.18	.23
Tks, Coast	lb.	...	.2380	... .2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.						
Rapeseed, blown, bbls, NY	lb.	.18	.18½	.18 .18½	.16½	.18
Denatured, drs, NY	gal.	...	nom.	... nom.	.95	1.00
Red, Distilled, drs	lb.	.11¾	.13½	.11¾ .143	.07¼	.13
Tks	lb.	.11	.11¾	.11 .12½	.06¼	.11½
Sardine, Pac Coast, tks	lb.	.0890		.66½ nom.	.39	.62½*
Refined alkali, drs	lb.	.127	.129	.12 .129	...	...
Light pressed, drs	lb.	.117	.119	.11 .119	.084	.122
Tks	lb.	.109	.11	.102 .11	.078	.112
Soy Bean, crude						
Dom, tks, f.o.b. mills	lb.	.12¼ nom.		.12¼ nom.	.05⅜	.12¼
Crude, drs, NY	lb.	.13	...	.13 nom.	.06¼	.12¼
Ref'd, drs, NY	lb.	.14¼ nom.		.14¼ nom.	.05½	.12¼
Tks	lb.	.13½ nom.		.13½ nom.	.07⅛	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY (A)	lb.	.1301	...	.1301 nom.	.11	.127
45° CT, blchd, bbls, NY	lb.	.1278	...	.1278 nom.	.103	.12
Stearic Acid, double pressed dist bgs	lb.	.14	.15¾	.14 .16½	.09½	.13¾
Double pressed saponified bgs	lb.	.15¼	.16¾	.15¼ .16¾	.09¾	.14
Triple pressed dist bgs	lb.	.17	.18¾	.17 .19½	.12½	.16½
Stearine, Oleo, bbls	lb.	...	.11	... .11	...	.09
Tall, crude, drs, c-l, wks	ton	...	55.00	40.00 55.00	...	...
tks, wks	ton	...	40.00	30.00 40.00	...	...
dist, drs, c-l, delv	lb.	...	.05	.04 .05	...	...
tks, wks	lb.	...	.04½	.03½ .04½	...	...
Tallow City, extra loose	lb.	...	.097¼	... .097¼	...	.07⅜
Edible, tierces	lb.	no prices		no prices	...	.05½
Acidless, tks, NY	lb.	.13	nom.	.13 nom.	.07½	.11½
Turkey Red, single, drs	lb	...	.08¾	... .08¾	.06½	.08¾
Double bbls	lb.	...	.12	... .12	.09½	.11
Whale:						
Winter bleach, bbls, NY	lb.	...	.1110	... .1110	.099	.1110
Refined, nat, bbls NY	lb.	...	.1070	... .1070	.095	.1070

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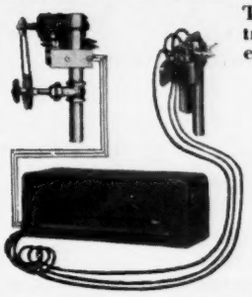

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THE WILLIAMS BROTHERS

(*Continued from page 413*)

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The years that have been spent with his "bios" led to exploration of many other plant growth stimulants to which Professor Williams gave the name "nutrilites." Among the many components which he gradually came to recognize as included within the term "bios" are all the substances which we now classify as members of the vitamin B complex. Among the earlier ones that he characterized as components of "bios" were thiamin, inositol and biotin. No one has adduced more evidence than he in support of the broad principle, now generally accepted, that the nutritional needs of man and higher animals are foreshadowed by and patterned on the needs of plants and microorganisms. He has become the father of vitamin analysis of foods and tissues by the use of microbiological techniques. A broad program of research under his guidance has been in progress at the University of Texas since he joined its staff in 1939. It has already led to the discovery of folic acid and offers promise of fruition in further knowledge of growth processes.

Always an enthusiast in research, Roger has done much to promote research as an integral part of his process of instruction; yet his enthusiasm for research has never been allowed to supplant his primary duties as a teacher. His well-known textbook on organic chemistry, as well as two texts on biochemistry, which he has faithfully revised from time to time, stand as testimony to the fact that he is a serious student of the pedagogical aspects of chemistry. He served the chemists of Oregon repeatedly as president of the State Section of the American Chemical Society.

Having resided far apart, the brothers have never worked together, though they are in constant correspondence concerning biochemical problems. Their views coincide quite well, although naturally the view point of Roger is somewhat more academic than that of Robert, due to the industrial experience of the latter. The brothers are alike in many characteristics: both are lean, blue-eyed, deep-voiced, persistently industrious, simple in their tastes, frugal in their habits, disinclined to pretense, and delight in their families and friends. Neither is inclined to be a recluse or to dissociate himself from everyday affairs of his community, or from the social, economic and business affairs of the world. For both the pursuit of science is an intellectual enjoyment but even more a means of improvement of the lot of humanity not only with respect to physical comforts but also as a source of wisdom and of character formation.

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Every item shipped from our eight acre plant at 335 DOREMUS AVE., NEWARK, N. J., is thoroughly overhauled and rebuilt by our expert staff of mechanics.

Send for latest issue of the Consolidated News listing hundreds of machinery values.

Consolidated Products Co., Inc.

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We buy and sell from a single item to a complete plant

SPECIALS!

STOKES Rotary "D" Tablet Machine
BUFLOVAK Vacuum Dryer, 24" x 20", chromed steel drum
BUFFALO No. 3 Vacuum Drum Dryer, 48" x 40", steel drum
STEEL TANKS from 1000 to 10,000 gallons
CAST STEEL AUTOCLAVE, 4' x 6', jacketed
STRUTHERS WELLS, Lead-Lined Agitated Kettle, 150 gals.
TOLHURST & FLETCHER, 40" Suspended Basket Extractors, m.d.
OLIVER Acid-Resisting Filter, 5' x 6'.

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Major items consist of:
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PULVERIZERS, Hammer Mills, Pebble Mills Crushers
MIXERS: Trough, jacketed and unjacketed
FILTERS: Shriver, Oliver, Sweetland
EVAPORATORS: Single and Multiple Effects
DRYERS: Rotary, Atmospheric, Vacuum

Send for complete circulars covering these liquidations.

BRILL Equipment Corp.
183 VARICK STREET NEW YORK

Machinery For Sale

6 x 50 Rotary Kiln
Raymond No. 0 Automatic Pulverizer
59" x 78" 17-Shelf Vacuum Dryer
8—3 x 4 and 4 x 7 Hummer Screens
3 x 30, 3½ x 24, 5½ x 60 and 6 x 40 Direct Heat Dryers
1—36-Ton Fairbanks Tank Scale

STORAGE TANKS
14— 10,000, 15,000, 20,000 and 26,000-gal. Cap. Horizontal and Vertical
1— 5,000-bbl. and one 55,000 Oil Storage
100,000-gal. Cap. Tank on 80-ft. Tower
50,000-gal. Cap. Tank on 75-ft. Tower
35,000-gal. Tank on 75-ft. Tower
5—Underwriter's Fire Pumps, 750 and 1,000 GPM.

TIDEWATER EQUIPMENT & MACHINERY CORPORATION
305 Madison Avenue New York, N. Y.

Central States Headquarters for used processing equipment.
Send for list of available equipment. Purchasers of single items or complete plants.
LOEB EQUIPMENT SUPPLY CO.
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Phone Monroe 5602

FOR SALE: One 8 ROLL LOUISVILLE FILTER-PRESS WITH RECEIVING TANK. Addres 503 Smith Tower Annex, Seattle, Washington.

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Now in operation but immediately available for inspection and sale

1—36-ft. 3-in., 1000-pound capacity, special 3 material, Blaw Knox steel weighing batcher, same as new. Price $1,000.00

1—Steel dry-mixing box for above with agitator, 7' long, 3' 4" wide, 3' deep. Price $500.00

1—Type B. V. Christie Special Dryer, 7' 6" x 75', complete with 50-h. p., 440-v., 3-p., 60-cy. induction motor with starter for drive, and one Sirocco high-temperature fan for drying air. Price $8,000.00

GAGER LIME MFG. COMPANY
Sherwood, Tennessee

Chemicals For Sale

For Sale
CRESYLIC ACID
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420 Lexington Ave., New York, N. Y.
Telephone LE 2-3324

FOR SALE: One-half ton aluminum chloride, anhydrous, in original drums. Write Filmite Oil Corporation, Station K, Milwaukee, Wisc.

Business Opportunities

CAPITAL TO INVEST

Will invest $25,000.00 with or without services in a Southern manufacturing company producing own raw materials and controls own sales. No brokers. BOX 1863, CHEMICAL INDUSTRIES

Help Wanted

POSITION AVAILABLE WITH ESTABLISHED COMPANY IN SOUTH FOR GRADUATE CHEMIST PREFERABLY WITH SOME EXPERIENCE IN PETROLEUM PRODUCTS. APPLICANT MUST BE CAPABLE, FOR POSITION WILL LEAD TO RESEARCH. SALARY WILL ADVANCE AS VALUE TO COMPANY INCREASES. Box 1874, CHEMICAL INDUSTRIES.

ENGINEER—Philadelphia manufacturer of recording-control instruments desires to employ several application engineers for the chemical industries. Applicants should be familiar with the practice and theory of industrial chemical processes and with the construction and use of available instruments and control devices. Must be capable of foreseeing practical needs for devices not yet available. A good education in physics or in chemical engineering considered essential. Applicants must be U. S. citizens. Reply to X-5, P. O. Box 3414, Phila., Pa.

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CHEMICAL ENGINEER

with large and long-established company having an extensive research and development program

Position is available for development work in plastics with this company which is not now engaged in plastics manufacture. The man desired must have a broad knowledge of the field. This is an unusual opportunity for a Chemical Engineer with the right technical qualifications and organizing ability. Inquiries will be held in strict confidence.

Reply: Box 1873
Chemical Industries.

CHIEF CHEMIST

Position as chief chemist open to man with mature experience in the formulation and manufacture of phenolic laminating, impregnating and molding resins. Plant location in large industrial area in Middle West where opportunities in this field are unlimited. Quick availability important because of volume of War work. Only a qualified man with highest reference will be considered. State full details in reply addressed to Box 1875, CHEMICAL INDUSTRY.

Sales Representatives Wanted

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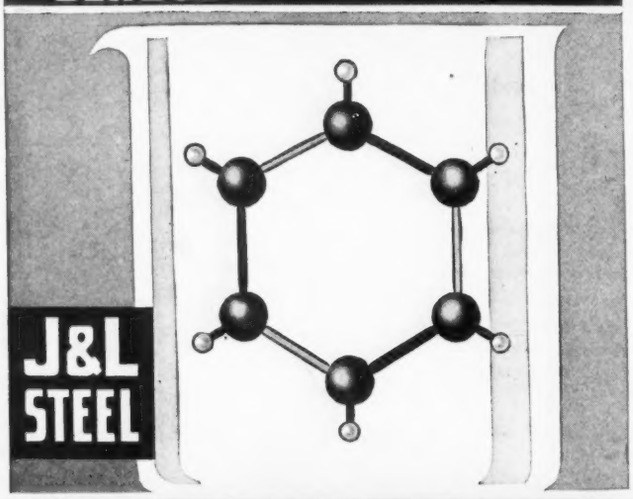

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Pacific Coast Borax Co.
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Chicago Los Angeles

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THE HEEKIN CAN COMPANY, Cincinnati, Ohio

"WE"-EDITORIALLY SPEAKING

The other day we received from E. F. Hutton & Company (members of the N. Y. Stock Exchange) a very interesting report entitled "The Coming Chemical Era—And What It Means To The Investor." It is a carefully prepared digest and one or two paragraphs particularly are worth repeating here.

"Besides favorable research and long term expansion factors, investors have long favored chemicals because of low labor ratio to operating expenses. Wages in the chemical and allied industries amounted to 10.2 per cent of the value of their products in 1937, according to the National Industrial Conference Board. For all industries, wages amounted to 17.5 per cent.

"The principal cloud on an otherwise brilliant outlook is the rising tax trend. Despite record-breaking sales in the first quarter of this year, net income of 21 chemical and drug companies, reflecting higher taxes, was 18 per cent less than in the like period a year ago. Biggest of the chemical companies, DuPont, has been forced to reduce its quarterly dividend to $1.00 from $1.75."

There can be little doubt about the lack of swollen war profits in World War II.

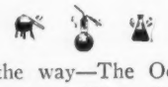
Some really momentous discoveries are being made in Washington these days. For example—President Roosevelt recently told his press conference that he had a feeling that the nation was being whipsawed between labor and farm groups. Well, certainly there were no patents or cartel agreements preventing something being done to correct the situation. Baruch and Hugh Johnson and lots of others urged long ago that ceilings be put on wages and all prices.

This issue might be called the Landis number what with Walter S. Landis, Vice-President of American Cyanamid, writing on "Industrial Planning" and James M. Landis, head of the OCD, contributing an exclusive article on "Fire—Foe of War Production." The former will give you some very interesting questions to ponder over concerning post-war problems, while the latter emphasizes the necessity of careful planning in chemical plants to prevent shut-downs forced by fires either started by carelessness in operations, by saboteurs, or by enemy incendiary demolition bombs. Readers of this publication are well acquainted with the backgrounds of both authors.

Priorities
Allocations
Price Controls

See the Statistical and Technical Data Section (Part 2 of this issue) for monthly digest of Government Regulations of Materials and Prices. Invaluable to you in your work.

A. D. McFadyen returns to the fold in this issue with his monthly feature "Personalities in Chemistry." The Williams brothers (Robert R. and Roger John) are the subjects this month. M. L. Crossley, Director of Research of Cyanamid, will be McFadyen's subject in the October number.



And by the way—The October issue will be the annual "New Chemicals for Industry" number, our National Chemical Exposition issue—and one that you will not want to miss we feel certain. Just to whet your appetite we mention the following:—"Sulfamic Acid—Newcomer in the Industrial Chemical Field," by Allan Perry of DuPont; "The Alkyl Esters of Phosphoric Acid," by Howard Adler and Willard H. Woodstock, both of Victor Chemical; "Polyhydric Alcohol Esters in the War Effort," by Jack W. Daum, Glyco Products. Also Dr. Gustav Egloff and George Hulla of Universal Oil Products will outline for C. I. readers the many ways of producing that very controversial product butadiene. After reading the manuscript it would appear that there are almost as many ways of producing this chemical essential to the synthetic rubber program as there are "rubber experts" in Washington.

And for plant executives two articles will be particularly interesting and instructive—"Executive Production Control in Chemical Plants," by W. von Peckmann of the Emulsion Department of Agfa-Ansco Division of General Aniline & Film; and "Conserving Used Chemical Plant Equipment," by George A. Yocum of the General Engineering Department of Monsanto. And last but by no means of less importance the October issue will contain "New Chemicals for Industry"—technical descriptions of the new products developed over the last two years—a veritable "round-up" in concise form of what has been developed in many of the important industrial research laboratories of the country.

And don't forget Victory Bonds and War Savings Stamps. Mr. Hitler won't like it but who cares?

A lot of congressmen are going to find out that the folks back home are pretty sore about the shilly-shallying of the last few months. They don't want to be "babied." They want action and action RIGHT NOW on such matters as income tax rates for 1943, an intelligent stand on the draft, a sales tax to help finance a greater proportion of the cost of the war, and particularly are they insistent that the Administration stop pussyfooting around on the question of definite control of wages and farm prices. We are losing the war on the home front at the very moment that the boys are showing Messrs. Hitler, Mussolini and Hirohito that all that stuff about being "soft" is just plain unadulterated bunk.

It looks now as though the salvage program will even include old silk stockings. The ladies are being urged by WPB to start saving these to get silk for the Navy's powder bags.

Percy Magnus is a very busy fellow these days what with an extended speaking tour and helping to run the big Victory Dinner of the N.W.D.A. scheduled for the Waldorf-Astoria on the evening of September 26. The N.W.D.A. have finally capitulated and will welcome the fair sex at the dinner. And by the way if you haven't read Percy's "Social Deodorants" the sequel to "Synthetic Thinking" you have really missed something.

Fifteen Years Ago

(From our files of fifteen years ago)

Japan and Germany enter into a dyestuff agreement.

Nicholas Longworth is the principal speaker at the Fifth Annual Chemical Banquet held in conjunction with the Eleventh Chemical Exposition.

James M. Doran, U. S. Prohibition Commissioner comes out strongly in favor of Government control of industrial alcohol production.

U. S. Stoneware acquires a new plant at Talmadge, Ohio, to supplement production at Akron.

Robert J. Quinn, Mathieson Alkali, elected President, Salesmen's Association.

Federal Government reports that first tests made in New Mexico under the Federal Potash Act are encouraging.

A. C. S. Council opposes officially participating in the activities of the Maison de Chemie, recently launched in Paris as a memorial to Berthollet.

TECHNOLOGY DEPT

VOL. 51 Sept. '42

CHEMICAL INDUSTRIES

Statistical and Technical Data Section

No. 3 Part 2

SEP 28 1942

State of Chemical Trade

Current Statistics (August 31, 1942)—p. 111

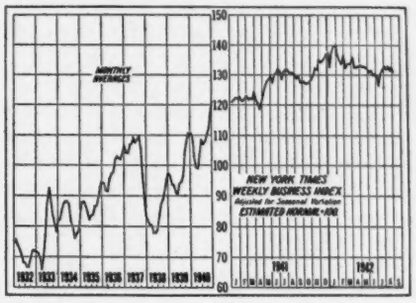
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1942	Carloadings 1941	Carloadings % of Change	Electrical Output* 1942	Electrical Output* 1941	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Aug. 1	863,528	883,022	— 2.1	3,649,146	3,263,082	+11.8	104.4	120.7	128.3	117.9	115.3	129.3	96.4	97.0	133	108.4
Aug. 8	849,752	878,505	— 3.3	3,637,070	3,233,242	+12.5	103.3	120.7	128.5	117.8	115.3	128.7	96.3	95.8	132	108.1
Aug. 15	868,845	890,337	— 2.4	3,654,795	3,238,160	+12.9	103.5	120.7	128.5	117.8	115.3	128.6	96.3	96.5	132.9	107.2
Aug. 22	869,404	899,788	— 3.4	3,673,717	3,230,750	+13.7	103.5	120.7	129.7	117.8	115.3	129.0	96.2	97.2	131.6	107.2
Aug. 29	899,419	912,720	— 1.5	3,639,961	3,261,149	+11.6	103.6	120.7	141.3	117.8	115.3	129.0	96.2	97.3	132.6	107.4

MONTHLY STATISTICS

CHEMICAL:	June 1942	June 1941	May 1942	May 1941	April 1942	April 1941
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	No Longer Available		.....	.....	.....	.....
Consumpt. in mfr. fert.	.....	.....	.....	.....	.....	.....
Stocks end of month	.....	.....	.....	.....	.....	.....
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal..	No Longer Available		.....	.....	.....	.....
Comp. denat. prod., wine gal...	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal...	.....	.....	.....	.....	.....	.....
Spec. denat. prod., wine gal. ..	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal...	.....	.....	.....	.....	.....	.....
Ammonia sulfate prod., tons *a*..	63,887.9	61,374.3	66,874	61,495	70,153	57,916.5
Benzol prod., gal. *b*	No Longer Available		.....	.....	.....	.....
Byproducts coke, prod., tons *a*..	5,117,784	4,841,700	5,275,803	4,845,854	5,058,799	5,068,799
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	946,198	913,725	898,034	935,239	983,607	927,399
Sheets, ship., lbs.	900,336	988,185	842,003	863,997	1,017,634	819,485
Rods, prod., lbs.	364,652	332,433	340,205	306,749	321,667	356,179
Rods, ship., lbs.	342,653	363,191	325,579	346,031	337,315	342,448
Tubes, prod., lbs.	63,626	140,482	57,457	130,457	109,593	136,048
Tubes, ship., lbs.	121,162	124,067	137,143	104,711	171,548	104,665
Cellulose acetate, sheets, rods, tubes						
Production, lbs.	556,579	512,506	465,100	524,393	567,799	402,492
Shipments, lbs.	523,011	523,438	482,676	472,328	588,458	408,252
Molding comp., ship.; lbs. ..	3,048,020	2,264,470	3,053,767	2,145,523	3,460,615	2,102,084
Methanol (Bureau of the Census)						
Production, crude, gals.	No Longer Available		.....	.....	.....	.....
Production, synthetic, gals. ...	.....	.....	.....	.....	.....	.....
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds...	3,178,812	4,313,872	3,534,240	4,733,765	3,836,777	4,223,849
Heavy goods, ship., linear yds..	2,829,929	3,164,815	2,859,545	3,172,565	2,852,024	3,326,482
Pyroxylin spreads, lbs. *c*	4,660,719	7,464,431	5,532,021	7,350,684	5,669,485	7,164,760
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*..	Exports and Imports No Longer Available					
Crude sulfur *d*	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Imports						
Chemicals and related prod. *d*..	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Employment (U. S. Dept. of Labor, 3 year av., 1923-25=100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	.....	.....	156.6	135.9	158.8	135.9
Other than petroleum	.....	.....	162.7	139.3	165.3	139.6
Chemicals	.....	.....	192.1	166.8	193.2	162.4
Explosives	.....	.....	No Longer Available		.....	.....
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25=100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	.....	.....	224.2	165.5	223.0	158.5
Other than petroleum	.....	.....	238.4	171.5	238.4	163.4
Chemicals	.....	.....	297.7	221.8	293.2	208.3
Explosives	.....	.....	No Longer Available		.....	.....
Price index chemicals*	.....	.....	.....	.....	96.4	86.4
Drugs & Pharmaceuticals* ...	.....	.....	.....	.....	126.7	97.5
Fert. mat.*	.....	.....	.....	.....	79.2	71.0
Paint and paint mat.	.....	.....	.....	.....	100.6	88.7
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	Exports and Imports No Longer Available					
Total phosphate rock	.....	.....	.....	.....	.....	.....
Total potash fertilizers	.....	.....	.....	.....	.....	.....
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ..	.....	.....	.....	.....	.....	.....
Sodium nitrate	.....	.....	.....	.....	.....	.....
Total potash fertilizer	.....	.....	.....	.....	.....	.....

INDUSTRIAL TRENDS



Business: According to the Federal Reserve Board's index of industrial production activity increased further in July and first half of August, reflecting continued growth in output of military products. The index rose during July from 176 to 180. The *New York Times* weekly business index however reflected a slight loss from 133 for week ending August 1 to 132.6 for week ending August 29. July employment set a new record with the Department of Labor estimating 37,100,000 employees in non-agricultural establishments or 435,000 higher than in the preceding month. Industry is beginning to feel the manpower and materials squeeze as definite hazards to increased production.

Steel: Production during August totaled 7,233,451 net tons of ingots and castings, according to the American Iron and Steel Institute. This figure exceeded by about 100,000 tons the total of 7,148,824 tons produced in July and was still further above output in August 1941, when 6,997,496 tons were produced. In producing the August tonnage the industry operated at an average rate of 95.4% of capacity compared with 94.5% in July and 95.6% in August of 1941. An important problem facing the industry is the procuring of scrap to keep the operating rate high. Scrap drives are being conducted and every person should make it his business to support the industry by turning in as much scrap as possible.

Electric Output: During the week ended August 29, the electric light and power industry produced 3,639,961,000 kilowatt hours of electrical energy, according to the Edison Electric Institute. This was a gain of 11.6% over the output in the corresponding week in 1941, but was slightly below distribution in the previous week. During

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the four weeks of August production averaged about 12.2% better than same period last year. Greatest gains continued to be made in Pacific Coast and southern states with the west central states running third.

Carloading: Loadings of revenue freight in the week ended September 5 showed a decline from the previous week at a season when traffic normally increases. The total for the week was 887,960 cars, compared with 899,419 cars in preceding week, or a decline of 1.3%. Loading in the first 36 weeks of 1942 amounted to 29,620,481 cars as compared with 28,525,330 in similar period of 1941, an increase of 3.8%, and with 24,150,012 cars in the 1940 period, an increase of 22.6%.

Construction: Construction volume continued large through July, according to F. W. Dodge Corp. Building and engineering contracts awarded in that month in the 37 eastern states amounted to $943,796,000, while this was 21% under the all-time high of June, 1942, it was far larger than any other contract total ever recorded. Compared with the figure for July of last year, $577,392,000, there was an increase of 63%. The cumulative total of construction contracts for the first seven months of this year has amounted to $64,667,521,000, compared with $3,127,354,000 in corresponding period of 1941, an increase of 49%. This year's 7 month contract total is the largest ever recorded for the first seven months of any year.

Retail Sales: According to the Federal Reserve Board department store sales increased more than seasonally in August and the Board's adjusted index rose further to an estimated 128% of the 1923-1925 average. Value of sales in August was about 5% smaller than a year ago when there was a large amount of anticipatory buying. However prices have risen about 15% over the past year so that physical volume of sales was considerably lower in August, 1942 than in same month a year ago.

Commodity Prices: Wholesale and retail food prices advanced further in July and the early part of August, while prices of petroleum products on the East Coast were reduced, and those for most other consumer goods continued to show little change. In raw material markets price declines occurred for cotton, inedible fats and oils, and some scrap items, particularly nonferrous metals and paper. Demand for materials used more exclusively for war products continued strong and prices of these materials were sustained at ceiling levels.

MONTHLY STATISTICS (cont'd)

FERTILIZER, (Cont'd)	June 1942	June 1941	May 1942	May 1941	April 1942	April 1941
Superphosphate e (Nat. Fert. Association)						
Production, total	390,081	307,907	383,617	341,348	381,619	330,113
Shipments, total	266,236	272,209	463,299	538,863	805,942	1,066,191
Northern area	139,076	156,903	264,886	370,551	407,551	509,920
Southern area	127,160	115,306	198,413	168,312	398,391	556,271
Stocks, end of month, total	.....	.....	802,975	863,633	857,644	1,021,161
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	159,520	143,548	329,942	331,697	766,503	1,461,189
Total, 12 southern	147,729	103,774	287,625	257,582	679,190	1,390,782
Total, 5 midwest	11,791	39,774	42,317	74,115	87,313	70,407
Fertilizer employment *i*	.....	.....	123.8	127.1	155.1	178.7
Fertilizer payrolls *i*	.....	.....	147.5	127.4	179.8	176.9
GENERAL:						
Acceptances outst'd'g *f*	.....	.....	177	219	182	217
Coal prod., anthracite, tons	.....	.....	.....	.....	5,153,000	3,198,000
Coal prod., bituminous, tons	.....	.....	.....	.....	49,000,000	5,975,000
Com. paper outst'd'g *f*	.....	.....	373	274	388	240
Failures, Dun & Bradstreet	.....	.....	938	1149	1,048	1,211
Factory payrolls *i*	.....	.....	192.6	144.1	186.6	134.7
Factory employment *i*	.....	.....	137.0	124.9	136.1	122.6
GENERAL MANUFACTURING:						
Automotive production	.....	.....	.....	.....	.....	.....
Boot and shoe prod., pairs	39,779,598	40,462,810	40,770,899	41,087,435	45,266,292	45,105,652
Bldg. contracts, Dodge *i*	.....	.....	.....	.....	.....	.....
Newsprint prod., U. S. tons	79,386	83,962	80,040	90,913	82,669	87,000
Newsprint prod., Canada, tons.	242,762	273,697	251,831	284,767	277,741	279,996
Glass containers ,gross‡	.....	.....	.....	.....	6,921,000	3,325,000
Plate glass prod., sq. ft.	4,726,000	18,533,000	4,310,000	18,394,000	5,570,000	18,344,000
Window glass prod., boxes	.....	.....	.....	.....	.....	.....
Steel ingote prod., tons	.....	.....	.....	.....	7,122,313	6,754,179
% steel capacity	.....	.....	.....	.....	96.3	97.6
Pig iron prod., tons	No Longer Available		.....	.....	.....	.....
U.S. cons'pt. crude rub., lg. tons	No Longer Available		.....	.....	.....	.....
Tire shipments	.....	.....	.....	.....	.....	.....
Tire production	.....	.....	.....	.....	.....	.....
Tire inventories	.....	.....	.....	.....	.....	.....
Cotton consumpt., bales	966,940	875,812	957,015	923,518	998,754	920,950
Cotton spindles oper.	23,090,560	22,994,980	23,120,666	22,980,286	23,100,202	22,787,396
Wool consumption *s*	50.9	55.7	47.0	57.0	52.0	52.8
Rayon deliv., lbs.	38,900,000	38,300,000	37,600,000	40,200,000	37,600,000	38,700,000
Rayon employment *i*	.....	.....	312.4	323.5	310.4	317.9
Rayon payrolls *i*	.....	.....	391.3	356.2	387.9	342.3
Soap employment *i*	.....	.....	87.3	92.2	91.8	91.6
Soap payrolls *i*	.....	.....	131.3	125.7	136.9	115.6
Paper and pulp employment *i*	.....	.....	128.3	122.7	129.8	120.3
Paper and pulp payrolls *i*	.....	.....	171.7	145.6	172.1	139.1
Leather employment *i*	.....	.....	93.5	89.6	95.7	90.0
Leather payrolls *i*	.....	.....	122.1	97.6	122.1	95.1
Glass employment *i*	.....	.....	123.3	124.0	125.8	121.8
Glass payrolls *i*	.....	.....	164.9	150.3	165.5	143.5
Rubber prod. employment *i*	.....	.....	94.7	106.4	95.2	105.0
Rubber prod. payrolls *i*	.....	.....	134.8	128.7	130.3	122.3
Dyeing and fin. employment *i*	.....	.....	135.8	141.2	138.2	143.3
Dyeing and fin. payrolls *i*	.....	.....	151.9	133.9	157.0	134.7
MISCELLANEOUS:						
Oils & Fats Index ('26=100)[1]	.....	.....	.....	.....	.....	.....
Gasoline prod., *p*	.....	.....	.....	.....	47,528	53,768
Cottonseed oil consumpt., bbls.	194,105	318,152	198,655	373,170	217,545	401,754
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments, dollars	$43,981,828	$54,336,429	$49,204,268	$58,413,147	$50,530,225	$51,963,528
Trade sales (580 estabts.) dollars	$22,430,391	$28,049,452	$26,000,489	$32,517,730	$25,839,940	$27,972,286
Industrial sales, total, dollars	$17,080,263	$21,022,220	$18,140,194	$20,544,155	$19,009,421	$19,266,308
Paint & Varnish, employ. *i*	.....	.....	135.8	141.4	138.7	137.4
Paint & Varnish, payrolls *i*	.....	.....	175.7	170.4	177.1	157.9

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

Hercules Profit Down

Hercules Powder Co., reports for the six months ended June 30, 1942, net profit of $2,195,130 after charges and estimated federal taxes of $11,907,836 and a provision of $350,000 for contingencies. Above net is equal, after preferred dividend requirements, to $1.47 a share on 1,316,710 shares of common stock.

This compares with net profit of $2,831,189, equal to $1.95 a common share in the first half of 1941, when federal taxes were $4,715,742.

For the quarter ended June 30, 1942, net profit was $993,320, equal to 66 cents a share on common, comparing with $1,470,763, or $1.02 a common share, in the June quarter of previous year, and $1,201,810, or 81 cents a common share, for the quarter ended March 31, 1942.

Net sales of goods and services for the six months ended June 30, last, were $56,568,982 compared with $34,858,700 for the corresponding period of 1941.

United Gas Corp. Earns $16.63

United Gas Corp. and subsidiaries (controlled by Electric Power & Light Corp.) in report for 12 months ended April 30, 1942, show net income of $7,481,682 after federal taxes, property retirement and depletion reserve appropriations, interest and other deductions, equal to $16.63 a share on 449,822 shares of $7 first preferred stock, on which unpaid dividend accumulations amounted to $18.54 1-6 a share at close of period.

This compares with net income of $4,821,124 or $10.72 a share on $7 first preferred stock in 12 months ended April 30, 1941.

For three months ended April 30, 1942, net income was $2,727,058 or $6.06 a share on $7 first preferred stock, comparing with net income of $2,351,449 or $5.23 a share on $7 first preferred stock in three months ended April 30, 1941.

Dividends and Dates

Name	Per Share	Stock Record	Payable
Abbott Laboratories, com., (quar.)	$ .40	9-15	9-30
4% pref. (quar.)	1.00	10-1	10-15
Climax Molybdenum Co.	.30	9-21	9-30
Clorox Chem. (quar.)	.75	9-15	9-25
Colgate-Palmolive-Peet Co., $4.25 pref. (quar.)	1.06¼	9-8	9-30
du Pont (E. I.) de Nemours & Co. com. (interim)	1.00	8-24	9-14
$4.50 pref. (quar.)	1.125	10-9	10-24
Durez Plastics & Chem., com.	.50	8-25	9-15
6% pref. (quar.)	.375	8-25	9-15
Gen. Printing Ink Corp., $6 pref. (quar.)	1.50	9-22	10-1
Harshaw Chem. Co.	.25	9-15	9-30
Hercules Powder Co.	.50	9-14	9-25
Hooker Electrochem. Co., 6% pref. (quar.)	1.50	9-11	9-30
Kopper Co., 6% pref. (quar.)	1.50	9-11	10-1
Metal & Thermit Corp., 7% pref. (quar.)	1.75	9-21	9-30
Molybdenum Corp. of Amer.	1.25	9-17	10-1
Monroe Cheme., $3½ pref. (quar.)	.875	9-15	10-1
Monroe Chem., $3½ of Amer. 6% pref. (quar.)	1.50	9-17	9-28
6% pref. (quar.)	1.50	12-17	12-28
Pittsburgh Plate Glass Co.	.75	9-10	10-1
Potash Co. of Amer.	.50	9-15	10-1
Procter & Gamble Co. 8% pref. (quar.)	2.00	9-24	10-15
Squibb (E. R.) & Sons, com.	.50	9-1	9-12
$5 pref. (quar.)	1.25	10-15	11-2
Texas Gulf Sulphur Co., (quar.)	.50	9-1	9-15
Union Carbide & Carbon Corp.	.75	9-4	10-1
United Carbon Co. (quar.)	.75	9-15	10-1
Victor Chem. Works	.25	9-19	9-30

Earnings Statements Summarized

Company:	Net income 1941	Net income 1940	Common share earnings 1941	Common share earnings 1940
Amer. Agricultural Chem. Co.—Year, June 30	$ 1,802,101	$ 1,121,873	$2.87	$1.79
Amer. Cyanamid Co.—Six months, June 30	2,089,001	2,592,762	.69	.91
Amer. Potash & Chemical—Six months, June 30	965,081	d72,222	1.83	....
Amer. Smelting & Refining Co.—Six months, June 30	5,253,641	6,768,818	1.60	2.29
Archer-Daniels-Midland Co.—Year, June 30	3,093,691	3,103,166	5.67	5.69
Clorox Chemical Co.—Year, June 30	425,197	389,746	3.88	3.55
Colgate-Palmolive-Peet Co.—Six months, June 30	2,241,073	2,399,074	1.01	1.09
Columbian Carbon Co.—Six months, June 30	1,546,156	1,904,036	2.88	3.54
Diamond Match Co.—Six months, June 30	1,030,957	1,002,991	.83	.79
Firestone Tire & Rubber Co.—Twelve months, May 31	11,023,372	*	4.29	....
General Aniline & Film Corp.—Six months, June 30	1,292,247	2,348,318	a1.76	a3.20
Harris-Seybold-Potter Co.—Year, June 30	416,939	402,683	2.48	2.37
Hilton-Davis Chemical Co.—Year, June 30	309,461	235,324	1.68	1.17
Merck & Co.—Six months, June 30	1,086,373	1,591,073	.83	1.45
National Oil Products Co.—Six months, June 30	290,126	384,250	1.34	1.78
Newport Industries, Inc.—June 30 quarter	104,457	z159,633	.17	....
Newport Industries, Inc.—Six months, June 30	278,955	z270,592	.45	....
Rayonier, Inc.—July 31 quarter	482,992	834,983	.18	.54
Sterling Products, Inc.—June 30 quarter	823,779	1,894,802	.47	1.09
Sterling Products, Inc.—Six months, June 30	3,491,589	4,752,981	1.99	2.73
United Drug, Inc.—Six months, June 30	968,139	518,637	.69	.37
United Gas Corp. & subs.—July 31 quarter	791,472	532,030	r1.76	r1.18
United Gas Corp. & subs.—Twelve months, July 31	7,741,123	4,978,536	r17.21	r11.07
Vick Chemical Co.—Year, June 30	2,211,430	2,804,026	3.25	4.12
Westinghouse El. & Mfg. Co.—Twelve months, June 30	18,280,821	20,716,817	5.70	7.75

a On Class A shares; *b* On Class B shares; *c* On Combined Class A and Class B shares; *d* Deficit. *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *b* On Preferred stock; On Class A shares; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods; ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period; ‡‡ Indicated earnings as compiled from quarterly reports; † Net loss; * Not available; ¶¶ Before interest on income notes; *x* Paid on or declared in last 12 months plus extra stock; *w* Last dividend declared, period not announced by company.

Price Trend of Representative Chemical Company Stocks

	Aug. 1	Aug. 8	Aug. 15	Aug. 22	Aug. 29	Net gain or loss last mo.	Price on Aug. 30, 1941	1942 High	1942 Low
Air Reduction Co.	32⅝	33¼	32½	33	33	+ ⅜	42⅞	38¼	29½
Allied Chemical & Dye Corp.	131	132	132½	134	134¼	+ 3¼	162½	149	118½
Amer. Agric. Chem.	20¼	19¾	20⅛	21½	20¼	— ...	18¾	23⅝	18¾
Amer. Cyanamid "B"	33⅝	32¾	34⅞	33⅞	32¾	— ⅞	41⅜	41⅞	28⅝
Columbian Carbon	73¼	74	75	75	74½	+ 1¼	80½	75	51
Commercial Solvents	8⅞	8¾	9	9	9	+ ⅛	11⅝	9¾	7¼
Dow Chemical Co.	110½	111½	115	111⅜	112	+ 1½	131¾	124¼	95
du Pont	113½	114	114	114¼	113	— ½	155⅞	144	102¾
Hercules Powder	63	59	59	60¼	60	— 3	74	72	51
Mathieson Alkali Works	19¾	19⅞	20½	22¼	22	+ 2¼	...	29½	19½
Monsanto	73	74⅞	77¾	79½	77	+ 4	91¾	91	66
Standard Oil of N. J.	37⅝	37¼	37¾	38⅝	38⅝	+ 1	43¼	42¼	30½
Texas Gulf Sulphur	31½	30⅞	31⅞	32½	32⅜	+ ⅞	37⅞	34⅞	28
United Carbide & Carbon	67¼	67⅜	68	69½	68⅛	+ ⅞	78¾	74¼	58
United Carbon Co.	46	46	46¼	47¼	47½	+ 1½	52	47½	37
U. S. Industrial Alcohol	29½	29¼	29¾	30½	30⅜	+ ⅞	33¾	34¼	24½

Commercial Solvents Reports

Commercial Solvents Corp. reports for the quarter ended June 30, 1942, a consolidated net profit of $596,730 after charges and a provision for federal income and excess profits taxes of $2,029,300 based on pending legislation. Above net is equal to 22 cents a share on 2,636,878 shares of capital stock.

This compares with a net profit of $347,990 or 13 cents a share in June quarter of previous year and a net profit of $547,181 or 21 cents a share as reported for the quarter ended March 31, 1942.

For six months ended June 30, last, net profit was $1,143,911 after providing $3,818,100 for federal taxes, equal to 43 cents a share, comparing with $904,982 or 34 cents a share in first half of 1941 when federal taxes amounted to $921,228.

Vick Earns $3.25

Preliminary report of Vick Chemical Co. for the fiscal year ended June 30, 1942, shows a net profit of $2,211,430 after depreciation, reserve for undetermined losses attributable to prevailing war conditions and provision of $2,222,361 for federal, state and foreign income and excess profits taxes. The above net is equal to $3.25 a share on 681,180 shares of capital stock outstanding at close of the period.

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Chemical Stocks and Bonds

PRICE RANGE 1942 August Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
45½	49⅞	37	55⅜	46	70¼	48¼	Abbott Labs.	No	755,204	1.60	2.90	2.89	2.61
32½	38¼	29½	45	34⅝	58⅛	36½	Air Reduction	No	2,736,855	2.00	2.62	2 38	1.98
132	149	118½	167½	135	183	135½	Allied Chem. & Dye	No	2,401,288	6.00	9.67	9.43	9.50
20¼	23⅝	18¾	27⅞	14⅝	21	12⅞	Amer. Agric. Chem.	No	627,981	1.45	1.79	1.45	1.22
33	35	27⅞	36	26	35½	23	Archer-Dan.-Midland	No	545,416	1.85	5.69	5.42	3.02
45¾	70	43	73¼	61	80½	57	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
112¼	116	111	121	111	124¾	112½	5% conv. cum. pfd.	100	68,597	5.00	27.77	26.01	18.94
19¾	21¼	15	20¾	18½	35½	20	Celanese Corp. Amer.	No	1,376,551	2.00	3.43	2.90	3.53
118⅞	120⅝	110	122½	116¾	121	105½	prior pfd.	100	164,818	7.00	35.08	38.69	38.67
14⅝	15¼	11½	16¼	10⅞	29	10⅛	Colgate-Palm.-Peet	No	1,962,087	0.50	3.09	1.62	2.74
72¾	74	51	83	64	99¾	71	Columbian Carbon	No	537,406	4.70	6.57	5.71	5.32
9⅛	9⅝	7¼	11⅞	7½	16⅝	8	Commercial Solvents	No	2,636,878	0.55	.99	.91	.61
50⅞	55⅝	42¼	55⅝	42¼	65⅛	40¼	Corn Products	25	2,530,000	3.00	3.37	3.10	3.32
175	176½	159	182½	164	184	168	7% cum. pfd.	100	245,738	7.00	41.78	7.23	7.70
16¼	21	14	21	12¾	23¾	12½	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
113	124¼	95	141⅝	111½	171	127¾	Dow Chemical	No	1,135,187	3.00	6.58	6.65	3.76
113	144	102¾	164⅝	125½	189¼	146½	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
124¼	126½	120	127	120⅞	129⅝	114	4½% pfd.	No	1,688,850	4.50	53.53	51.48	52.25
125¼	141	108	145½	120¼	166⅝	117	Eastman Kodak	No	2,488,242	6.00	8.57	7.96	8.55
175½	176	170	183⅛	160	180	155	6% cum.	100	61,657	6.00	350.14	325.62	337.65
33½	38⅝	27	41	32½	39¼	24¾	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
3⅞	5⅜	3⅜	7⅛	4⅞	10	5⅛	Gen. Printing Ink	1	735,960	0.65	1.00	.86	.94
13½	15	12½	17⅞	11	19⅝	11	Glidden Co.	No	829,989	1.50	3.08	1.56	1.70
39¾	44	37⅝	46	35	45	30	4½% cum. pfd.	50	199,940	2.25	15.08	8.64	9.27
90¼	93½	79¼	96	76	113¾	88⅞	Hazel Atlas	25	434,409	5.00	6.63	5.98	6.60
60	72	51	80¼	65¼	100½	60	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
130	132	125	133½	123½	133⅛	126¼	6% cum. pfd.	100	96,194	6.00	69.71	66.38	60.87
23⅝	27	21	29⅞	20¾	29	16⅝	Industrial Rayon	No	759,325	2.50	3.04	3.51	1.77
20½	23½	19	27	19	47⅝	21¼	Interchem.	No	290,320	1.60	6.01	2.47	4.10
100¾	111½	100¾	113¼	107	113	91	6% pfd.	100	65,661	6.00	32.79	16.99	24.27
7⅝	7⅝	3½	..	..	..	..	Intern. Min. & Ch.	5	473,981	...	...	...	...
48	48	38	..	..	..	..	4% cum. pfd.	100	100,000	...	...	...	...
26¾	28¾	24½	31⅞	23	35⅞	19⅝	Intern. Nickel	No	14,584,025	2.00	2.23	2.30	2.39
41⅜	48¼	39	49	38¼	39⅝	26⅞	Intern. Salt	No	240,000	3.00	3.76	3.98	1.92
21½	22¼	17¼	22	17¼	23⅝	14⅝	Kellogg (Spencer)	No	509,213	1.70	3.66	2.74	1.30
26	26½	20½	45⅝	19¼	53⅝	30	Libbey Owens Ford	No	2,513,258	3.50	3.52	3.97	3.21
13⅝	15½	11⅜	16⅝	13	18⅝	10⅝	Liquid Carbonic	No	728,100	1.00	2.92	2.21	1.62
22⅝	29½	19½	31¼	24⅛	29⅝	21	Mathieson Alkali	No	828,171	1.50	1.90	1.72	1.12
77	91	66	94	77	119	79	Monsanto Chem.	No	1,241,816	3.00	4.90	4.32	4.01
117	117½	110	118½	112	119	110	4½% pfd. A.	No	50,000	4.50	38.43	57.38	54.29
115	119	112	123	115	123	113½	4½% pfd. B.	No	50,000	4.50	38.43	57.38	54.29
107½	110⅝	102½	113½	106⅝	...	...	4 % pfd. C.	No	50,000	4.50	38.43	...	...
13⅝	16¼	11⅞	19¼	13¼	22⅝	14¼	National Lead	10	3,090,664	0.50	1.10	1.34	1.23
157	168	145	176	100½	170	160	7% cum. "A" pfd.	100	213,793	7.00	24.68	28.54	27.04
136	146	120	154	136	159⅝	133	6% cum. "B" pfd.	100	103,277	6.00	49.99	59.46	55.30
32	35	29½	36	26	44	25⅝	National Oil Products	4	179,529	1.95	4.11	3.92	3.89
7⅞	11⅝	7¼	11⅞	5⅜	14⅜	6¼	Newport Industries	1	621,359	0.75	1.14	0.50	0.66
48½	54	43¼	54	38⅝	64⅝	43	Owens-Illinois Glass	12.50	2,661,204	2.50	3.40	2.71	3.17
48⅝	52	42	61½	47⅛	71⅝	53	Procter & Gamble	No	6,409,418	2.00	4.20	4.37	3.80
120½	121½	115	120	115	118¾	113½	5% pfd.	100	169,517	5.00	324.38	336.78	298.55
13¾	14⅝	10½	16⅝	10½	13⅝	7⅝	Shell Union Oil	No	13,070,625	1.00	1.33	1.05	0.77
26⅝	28½	19⅜	35¼	18⅞	23¼	13¼	Skelly Oil	No	981,349	1.50	6.03	3.28	1.99
25	27½	20	34⅛	24⅞	29	20⅝	S. O. Indiana	25	15,272,020	1.00	3.17	2.20	2.24
38½	42¼	30½	45⅞	33	46¼	29⅞	S. O. New Jersey	25	27,278,666	1.00	5.15	4.54	3.27
8½	9⅝	7½	9⅝	6	9¼	4¼	Tenn. Corp.	5	853,696	1.00	1 60	1.36	0.41
35⅝	39¼	30	46⅝	34½	47⅝	33	Texas Corp.	25	10,876,882	2.00	4.77	2.90	3.02
32⅜	34⅞	28	38⅞	30⅛	37¼	26⅞	Texas Gulf Sulphur	No	3,840,000	2.50	2.35	2.38	2.04
68⅜	74⅝	58	79⅞	60	89⅝	59⅛	Union Carbide & Carbon	No	9,277,288	3.00	4.53	4.55	3.86
46½	47¼	37	53	35	66⅝	42½	United Carbon	No	397,885	3.00	4.30	3.36	3.81
30⅝	34¼	24½	34¼	20	28	14	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
15	20⅞	14¼	24½	15⅛	43⅝	25	Vanadium Corp. Amer.	No	405,706	1.50	3.03	2.85	3 25
21⅝	25½	18¾	27¼	20	21⅝	14	Victor Chem.	5	750,000	1.40	1.59	1.57	1.59
1⅝	2⅜	1	2½	⅝	4¼	1⅝	Virginia-Caro. Chem.	No	486,122	...	—1.89	—1.36	—1.57
29¾	37	22½	29½	18⅞	31⅝	14	6% cum. part. pfd.	100	213,052	1.00	1.69	2.89	2.41
26⅛	31½	22	36½	27¾	38¾	27¾	Westvaco Chlorine	No	553,132	1.85	2.92	2.96	2.91
106¾	106¾	100½	112	105	109⅞	108	cum. pfd.	No	58,415	4.50	22.19	21.98	...
NEW YORK STOCK EXCHANGE													
33½	41⅞	28⅝	43⅝	31	39⅞	26	Amer. Cyanamid "B"	10	2,618,387	0.60	2.42	2.44	2.07
7⅛	8	6½	7⅝	6⅝	8⅛	5	Duval Texas Sulphur	No	500,000	1.25	1.42	1.16	1.25
68¼	88½	67½	90	65	92	60	Heyden Chem. Corp.	100	104,983	3.00	9 04	7.86	5.98
67⅞	73½	55¼	96¼	55	104	65	Pittsburgh Plate Glass	25	2,188,040	5.00	6.82	6.30	4.94
76⅞	78¼	59¾	84	61	100	62½	Sherwin Williams	25	638,927	3.00	7.83	6.57	5.96
112	115	110	115½	108½	114¾	106	5% cum. pfd.	50	122,289	5.00	47.82	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
139½	175½	125	185	162	192	158¾	Pennsylvania Salt	50	150,000	8.00	10.99	11.51	8.63

PRICE RANGE 1942 August Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
103⅜	104¼	101⅝	104½	100⅜	105¼	100¼	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
45½	46	34	42¼	26⅛	41	27½	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
45½	45½	35	40	25⅜	30⅜	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
97⅝	97⅞	95¾	99⅞	94¾	100¼	93½	Shell Union Oil	1954	2½	J-J	85,000,000
104⅝	105½	103	106⅝	102½	107	101⅛	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104⅞	105⅝	103⅜	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
104⅞	106	104½	107⅜	102⅞	106¼	102	Texas Corp.	1959	3	A-O	40,000,000

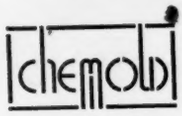
* Including extras paid in cash.
** For either fiscal or calendar year.
x New stock.

New Trade Marks of the Month

397,032

KORAY
444,675

KLENOFOAM
446,445



447,527

450,505

452,308

MUL-ENE
453,125

NIKADIN
453,126

NO-MOLD
397,045

CALPANATE
450,893

452,618

USSP
453,128

HEMACOLL-MORSE
433,065

448,328

CASCOLAC
451,045

Masonite
452,750

453,135

SOLVO
441,910

BOXYGEN
451,403

Benaloid
452,751

CIBANAPHTOL
444,235

PHENO-THEO-SAT
448,452

NYRAY
451,671

VITA-MIN-GO
452,815

KASIL
453,165

FULLACINE
444,236

CISCO PEP
448,782

COSMOLINE
451,677

STAMININA
452,971

PLASTENDER
453,190

MIGAFAR
444,237

SALAZOPYRIN
450,438

AIR-O-CEL
451,727

FEN-R-TABS
453,122

KOLOC
453,223

HY-LENE
453,123

M S A
444,509

VIO-LITE
450,459

VAN-EX
452,006

KRUMATE
453,124

PEANUTOLA
453,259

Trade Mark Descriptions

397,032. Stayner Corporation; Berkeley, Calif; Oct. 21, '40; for pharmaceutical preparations; since Sept. 25, '40.

397,045. The Embalmers' Supply Co; Westport, Conn.; Apr. 28, '42; for moisture absorbent crystals for use in the embalming trade; since Aug. 13, '40.

433,065. Irving A. Morse; New York, N. Y.; June 15, '40; for prepared medicinal tonic for the treatment of anemia and vitamin deficiency; since May 1, '40.

441,910. Great Stuff Products Company, Inc.; West New York, N. J.; Mar. 25, '41; for hand cleaner; since May 8, '26.

444,235. Society of Chemical Industry in Basle; Basel, Switzerland; June 5, '41; for coal tar colors; since June 30, '27.

444,236. Society of Chemical Industry in Basle; Basel, Switzerland; June 5, '41; for coal tar colors; since Aug. 19, '31.

444,237. Society of Chemical Industry in Basle; Basel, Switzerland; June 5, '41; for chemical substances; since Apr. 23, '37.

444,509. Nube Safety Appliance Company; Pittsburgh, Pa.; June 13, '41; for mine shot firing apparatus, explosives carrier, carrier for detonators, powder bags, and cartridges; since May 31, '17.

444,675. Koray Limited; London, Eng.; June 19, '41; for pharmaceutical preparations; since Mar. 23, '36.

446,445. West Disinfecting Company; Long Island City, N. Y.; Aug. 21, '41; for soapless cleaner; since May 22, '41.

447,527. Western Plastics, Inc.; Los Angeles, Calif.; Oct. 3, '41; for plastic compounds; since Aug. 4, '41.

448,328. Masury-Young Company; Charleston, Mass.; Nov. 1, 41; for floor oils, spray oils, and cedar and wax sprays and like preparations for settling dust and for cleaning, preserving, and beautifying wood, composition, or painted cement floors, and soap powders; since Jan. 4, '39.

448,452. Grenor Pharmaceuticals, Inc.; Jersey City, N. J.; Nov. 7, '41; for medicinal preparation; since Oct. 1, '41.

448,782. Cities Service Oil Company; Bartlesville, Okla.; Nov. 21, '41; for petroleum lubricant in mixture with solvents for freeing carbonaceous material, gums, varnish and the like, from valves and piston rings, and lubricating such parts; since Mar. 3, '37.

450,438. Aktiebolaget Pharmacia; Stockholm, Sweden; Jan. 24, '42; for medicines and dyestuffs; since Feb. '41.

450,459. Rhode Island Laboratories, Inc.; West Warwick, R. I.; Jan. 24, '42; for luminous paints, and pigments, lacquers and suspending agents used in making said luminous paints; since Dec. 26, '41.

450,505. Bayonne Company, Inc.; New York, N. Y.; Jan. 27, '42; for chemical and allied products; since July 15, '41.

450,893. F. D. Buxton, Inc.; Baltimore, Md.; Feb. 11, '42; for anti-gray hair preparation for internal use; since Feb. 6, '42.

451,403. Boxygen Laboratories, Ltd.; Toronto, Canada; Mar. 4, '42; for antiseptic dentifrice for professional and home use; since June 7, '39.

451,671. Colgate-Palmolive-Peet Company; Jersey City, N. J.; May 17, '42; for soap; since Feb. 10, '42.

451,045. The Borden Company; New York, N. Y.; Feb. 18, '42; for aqueous solutents; since May 14, '37.

451,677. E. F. Houghton & Co.; Philadelphia, Penna.; Mar. 17, '42; for rust and corrosion preventive compounds; since June 21, '17.

451,727. Rock Wool Industries, Inc.; Detroit, Mich.; Mar. 18, '42; for rock wool and cotton; Dec. 30, '40 on rock wool; and since July 14, '42 on cotton.

452,006. Continental Ore Corporation; New York, N. Y.; Mar. 30, '42; for ferrous metals and ferrous metal alloys and vanadium alloys; since Nov. 6, '41.

452,308. Crosset Chemical Company; Crosset, Ark.; Apr. 13, '42; for hardwood charcoal; since Mar. 7, '42.

452,618. Emma A. McCormac (Maco Manufacturing Company); Oakland, Calif.; Apr. 27, '42; for compounds for general cleaning purposes and for cleaning white side wall tires; since July, '39.

452,750. Masonite Corporation; Chicago, Ill.; May 2, '42; for lignin plastic molding materials in powder and sheet form; since April 24, '37.

452,751. Masonite Corporation; Chicago, Ill.; May 2, '42; for lignin plastic molding materials in powder and sheet form; since April 24, '37.

452,815. Vita-Min-Go., Inc.; New York, N. Y.; May 5, '42; for vitamins A B_2 and C and for calcium and iron in pill form; since May 1, '42.

452,971. H. H. Tebault Corporation; New York, N. Y.; May 12, '42; for vitamin and mineral food supplement; since April 1, '42.

453,122. The Shores Company, Inc.; Cedar Rapids, Iowa; May 19, '42; for poultry medicine used in the treatment of baby chicks and domestic fowls; since Mar. 1, '40.

453,123. The Shores Company, Inc.; Cedar Rapids, Iowa; May 19, '42; for poultry medicine; since Mar. 1, '40.

453,124. The Shores Company, Inc.; Cedar Rapids, Iowa; May 19, '42; for poultry medicine; since Mar. 1, '40.

453,125. The Shores Company, Inc. Cedar Rapids, Iowa; May 19, '42; for poultry medicine; since Mar. 1, '40.

453,126. The Shores Company, Inc.; Cedar Rapids, Iowa; May 19, '42; for poultry medicine; since Mar. 1, '40.

453,128. U. S. Standard Products Company; Woodworth, Wis.; May 19, '42; for pharmaceutical specialties; since Jan. 1, '20.

453,135. Wilmington Chemical Corp.; Wilmington, Del.; May 18, '42; for viscous liquid or semi-liquid chemical raw material of unsaturated hydrocarbon nature; since Mar. 17, '42.

453,165. Philadelphia Quartz Company; Philadelphia, Pa.; May 21, '42; for potassium silicate, either anhydrous, hydrous, crystalline, glassy or in solution or in admixture with other alkaline salts, useful in the manufacture of gels, cements, coatings, detergents, and the like; since Aug. 19, '41.

453,190. Allied Chemical & Dye Corporation; New York, N. Y.; May 23, '42; for bituminous material for use in compounding rubber; since Mar. 11, '42.

453,259. Eugenie Marchado; New York, N. Y.; May 19, '42; for cleansing soap; since Oct. 1, '41.

New Trade Marks of the Month

amron
453,303

RICHINE
453,603

MICRAFORM
453,604

(D.S.W.)
453,826

Rembrandt
453,951

KCM
453,985

ORO
453,334

LAURON
453,637

ALLPLEX
453,828

OLIKROME
453,962

STRUCTO·CAL
453,347

CHEMISTRY IS THE KEYSTONE OF INDUSTRY
453,641

THIAZINC
453,838

MERSAN
453,957

ENTRIDIN
454,002

DRYSOL
453,391

DURON
453,903

AUTOCHEMIC
453,958

SPERGON
454,022

RENOVINE
453,421

TOOLEZE
453,721

BEXTRA
453,905

L-A-101
453,963

SULFAPAC
454,023

Geigy
453,440

EXI
453,748

Geminex
453,906

TRESADERM
453,966

BOMB-X
454,067

VITA-GEMS
453,492

ISOBUNAL
453,761

SULMEFRIN
453,968

IGNOLIT
453,973

SYLVANIA
454,157

AMOLOID
453,549

ULTRA A
453,907

SANIGNIT
453,974

SILVLOY
453,557

OCTA Vee's
453,784

MEMBAN
453,929

PERMAGLAZE
453,981

NICOTHIAMIN
454,181

Trade Mark Descriptions (*Cont'd.*)

453,303. Edw. H. Hufnagel (Norman Chemical Company); Mount Vernon, N. Y.; May 27, '42; for cleaning compound; since Feb. '42.

453,334. Kensington Steel Company; Chicago, Ill.; May 28, '42; for manganese and steel and rough and partly finished manganese and steel castings; since Sept. 1, '23.

453,347. United States Gypsum Company; Chicago, Ill.; May 28, '42; for gypsum plaster; since April, '40.

453,391. F. E. Booth Company, Inc.; San Francisco, Calif.; June 1, '42; for vitamin D activated animal sterol in a wheat base; since May 21, '42.

453,406. Barnsdall Tripoli Corp; Seneca, Mo.; June 2, '42; for tripoli flour (ground tripoli stone) since May, '16.

453,421. McKesson & Robbins, Inc.; New York, N. Y.; June 2, '42; for medicinal preparation; since 1895.

453,440. Geigy Company, Inc.; New York, N. Y.; June 3, '42; for dyestuffs, chemicals and chemical specialties; since May 13, '42.

453,492. Hollis Company; Newark, N. J.; June 5, '42; for therapeutic vitamin preparation; since May 4, '42.

453,500. John H. Wallace, Jr. (Wallace Laboratories); New Brunswick, N. J.; June 5, '42; for medicinal preparation; since May 25, '42.

453,549. Kelco Company; San Diego, Calif.; June 8, '42; for algin film-forming and binding compound; since May 22, '42.

453,557. Permo Products Corporation; Chicago, Ill.; June 8, '42; for silver base alloy capable of heat treatment tempering containing copper with or without suitable metals; since June 4, '42.

453,603. Richmond Oil, Soap and Chemical Co., Inc.; Philadelphia, Penna.; June 11, '42; for cleansing compound; since April 15, '41.

453,604. Smith, Kline & French Labs.; Philadelphia, Pa.; June 11, '42; for sulfonamides; since June 3, '42.

453,637. Endo Products, Inc.; New York, N. Y.; June 13, '42; for preparation of gold compound for use in arthritis; since Mar. 20, '42.

453,641. The Pennsylvania Salt Mfg. Co.; Philadelphia, Penna.; June 13, '42; for fabric cleaning compounds; since Apr. 8, '42.

453,721. International Chemical Co., Inc.; Philadelphia, Penna.; June 17, '42; for lubricating oils for cutting and drilling tools; since May 25, '42.

453,748. C. H. De Wolf Company; East Haven, Conn.; June 19, '42; for pharmaceutical compound; since July 7, '41.

453,761. Sharp & Dohme, Inc.; Philadelphia, Penna.; June 19, '42; for therapeutic preparations; since June 11, '42.

453,784. Vee's Vitamin Company; Wichita, Kans.; June 20, '42; for medicinal tablet containing a combination of vitamins; since May 10, '42.

453,826. C. H. Harnage; Perry, Fla.; June 23, '42; for vermifuge for treating screw worms; since Dec. 28, '41.

453,828. Park Drug Company, Inc.; New York, N. Y.; June 23, '42; for tablets containing vitamins and minerals; since Jan. '42.

453,838. Hart Drug Corporation; Miami, Fla.; June 24, '42; for sulfathiazole-calamine cream; since June 3, '42.

453,903. United States Gypsum Company; Chicago, Ill.; June 26, '42; for vegetable fiber hardboards consolidated under heat and pressure; since March '42.

453,905. American Dietaids Company, Inc.; Yonkers, N. Y.; June 27, '42; for vitamin B tablets; since May 16, '41.

453,906. American Dietaids Company, Inc.; Yonkers, N. Y.; June 27, '42; for vitamin tablets; since Dec. 12, '41.

453,907. American Dietaids Company, Inc.; Yonkers, N. Y.; June 27, '42; for vitamin capsules; since Sept. 30, '41.

453,929. Schieffelin & Company; New York, N. Y.; June 27, '42; for pharmaceutical preparation; since Apr. 28, '39.

453,951. Wool Novelty Co., Inc.; New York, N. Y.; June 29, '42; for dyes and tints for fabrics for home use; since June 15, '42.

453,957. Endo Products, Inc.; New York, N. Y.; June 30, '42; for preparation consisting of an antiseptic solution; since May 1, '42.

453,958. Eutectic Welding Alloys, Inc.; New York, N. Y.; June 30, '42; for chemical preparations used in brazing, soldering, or heat treating metals; since Oct. '40.

453,962. E. J. Lavino and Company; Philadelphia, Pa.; June 30, '42; for refractory plastics and refractory cements; since June 3, '42.

453,963. Walter Neumann; New York, N. Y.; June 30, '42; for local anesthetic; since June 17, '42.

453,966. Sharp & Dohme, Inc.; Philadelphia, Pa.; June 30, '42; for astringents, analgesics, antiseptics and ointments; since June 25, '42.

453,968. E. R. Squibb & Sons; New York, N. Y.; June 30, '42; for antibacterial preparations; since May 1, '42.

453,973-453,974. Ignace Alembik; New York, N. Y.; July 1, '42; for composition for impregnating wood, fabric, and other fibrous material to make the same fire retardant; since June 26, '42.

453,981. Fort Pitt Chemical Company; Pittsburgh, Pa.; July 1, '42.; for glazing compound; since Dec. 11, '40.

453,985. Kennecott Copper Corp.; New York, N. Y.; July 1, '42; for copper ingots and copper ingot bars; since May 15, '42.

454,002. Enco Products, Inc.; New York, N. Y.; July 2, '42; for preparation of aqueous extract of anterior pituitary gland used for endocrine therapy; since Apr. 15, '42.

454,022. United States Rubber Company; New York, N. Y.; July 2, '42; for seed protectant and disinfectant; since Dec. 31, '40.

454,023. Abbott Laboratories; North Chicago, Ill.; July 3, '42; for antibacterial agent for use in body cavities; since June 19, '42.

454,067. The Bomb-X Company; Merchantville, N. J.; July 6, '42; for compound for controlling incendiary bombs and fires; since June 23, '42.

454,157. Sylvania Industrial Corp.; Fredericksburg, Va.; July 10, '42; for sodium sulfate; since April 10, '42.

454,181. Abbott Laboratories; North Chicago, Ill.; July 13, '42; for vitamin preparation; since April 14, '41.

War Regulations
Priorities, Allocations, Import and Price Controls—p. 33

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to July 31, 1942. This month new regulations are brought up to August 31, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Acetone

August 20, 1942. Maximum Price Regulation No. 36 reduces price for fermentation acetone from 15.8 to 8½ cents per pound. Separate maximum prices set for synthetically produced acetone. The specific maximum prices for fermentation acetone are producer prices for tank car shipments delivered in "eastern territory." Differentials are provided for shipments of drums in carload lots and l.c.l. lots. Eastern territory is defined as New Mexico, Colorado, Wyoming, Montana, all states east of these and the District of Columbia. A premium is provided for "western territory," which includes all other states.

Aluminum

August 19, 1942. To provide adequate supplies of aluminum for implements of war, the Director General for Operations has issued Supplementary Order M-1-i, revoking Orders M-1-e and M-1-f, and consolidating their provisions, with changes, in a combination conservation and use-control order. By restricting some less essential military uses, the order will insure adequate supplies for combat items.

In consolidating the two previous orders, the new order makes several important changes in aluminum control.

Ammonium Sulfate

August 17, 1942. Sulfate of ammonia —one of the most important agricultural fertilizers—was brought under a specific "dollars and cents" price ceiling on all sales by producers, importers and "primary jobbers," in a new regulation issued by Price Administrator Leon Henderson.

The new measure, titled Maximum Price Regulation No. 205, Sulfate of Ammonia Producers, Importers and Primary Jobbers, is effective August 22, 1942 and provides that the lower of the following maximum prices may be charged:

(1) The base price of $28.20 per ton at inland oven plus the transportation charges to buyer's destination from the inland oven nearest the buyer's destination, or

(2) The base price of $29.20 per ton at port, plus the transportation charges to buyer's destination from the port nearest to the buyer's destination.

With the exception that no separate differential is granted in the regulation for "spot sales," these prices are at approximately the same level requested in May, 1941 and again last February of the producers by the Price Administrator. The great majority of producers adhered to this request and this price pattern was frozen by the General Maximum Price Regulation.

Butyl Acetate

(See Butyl Alcohol)

Butyl Alcohol

August 20, 1942. Maximum Price Regulation No. 37 reduces the maximum price for normal fermentation butyl alcohol from 15.8 to 12½ cents per pound. It also establishes a price for normal fermentation butyl acetate one cent per pound higher than for normal fermentation butyl alcohol: e.g. 13½ cents per pound, tank cars delivered.

Separate maximum prices for normal synthetic and normal fermentation butyl alcohol are established.

The specific maximum prices for normal fermentation butyl alcohol and normal fermentation butyl acetate are producer prices for tank car shipments delivered in "eastern territory." Differentials are provided for shipments of drums in carload lots and l.c.l. lots Eastern territory is defined as New Mexico, Colorado, Wyoming, Montana, all States east of these and the District of Columbia. A premium is allowed for shipments to "western territory"—all States not included in the eastern area.

Caustic Soda

August 3, 1942. Amendment No. 4 to General Inventory Order M-161 permits unlimited storage by industrial users of caustic soda and soda ash, widely used in the chemical industry.

Increasing supplies of these materials, used in the manufacture of aluminum and other non-ferrous metals, glass, soap, textiles, leather, dyes, petroleum, paper and other products, make it advisable that wide distribution be made now against future demand.

Chlorinated Paraffin

August 10, 1942. Chlorinated paraffin, the entire supply of which is used by the Army, the Navy and the Maritime Commission, is placed under complete allocation control by General Preference Order M-189.

Chlorinated paraffin is used in fabric treatment and in the manufacture of lubricating oils.

Consumers must file by the 10th of the month preceding the month in which they seek delivery requests for allocation on Form PD-619. Producers must schedule their deliveries monthly on Form PD-618, by the 15th of each month.

Cobalt

August 21, 1942. Cobalt used for ground coat frit is limited, in any one quarter, to 35 per cent of the amount used in the first six months of 1941, by the terms of Amendment No. 2 to Conservation Order M-39-b, issued by the Director General for Operations.

Copper

August 25, 1942. In order to save 1,200 tons of copper annually, the War Production Board has prohibited the use of the metal or its alloys to manufacture parts for fuses, other than current carrying parts, effective 15 days from today.

The order, Limitation Order L-161, also prohibits the assembly of fuses with copper parts other than parts carrying electric current, effective 30 days from today.

Sales of fuses by manufacturers are restricted, effective 15 days from today, to sales to other manufacturers, or on

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War Regulations

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A-10 or higher, preference ratings. Adequate supplies are expected to be made available to civilian users of fuses, since distributors are permitted to obtain fuses and other electrical supplies through the use of Form PD-IX.

Ethyl Alcohol

August 8, 1942. A decrease in the amount of ethyl alcohol that may be used in the manufacture of shoe polish and an increase in the amount to be used for vinegar were made by the Director General for Operations in a revision of the alcohol order, M-30. The increase for vinegar was made because of its demand as a food. No other changes are made in the amounts permitted for the manufacture of various products, which are 70 per cent for toilet articles and similar items and unlimited for chemical and military uses.

References to isopropyl and butyl alcohol and their derivatives are removed from M-30 as they are covered by other orders, and the restrictions on the use of alcohol in anti-freeze also are removed for the same reason.

Nitrocellulose

August 6, 1942. Control over the distribution of soluble nitrocellulose ordered by the Director General for Operations.

Soluble nitrocellulose falls into four types, depending upon end use; lacquer type, coated textile type, film type and plastics type. This order, M-196, gives the Director General power to direct the amounts of each type that may be produced.

Research Laboratories

August 11, 1942. Research laboratories which put into process $5,000 worth of metals per quarter or more, are required to file under the Production Requirements Plan.

Special instructions for the use of research, analytical and testing laboratories in filling out Form PD-25A have been issued by the Safety and Technical Equipment Branch.

Laboratories are required to show figures on anticipated requirements because such information is necessary to direct the flow of critical materials, the demand for which is far in excess of supply.

Class I producers (those who put into process in any one quarter $5,000 worth of metals in the form listed on the Metals List) must file under the Production Requirement Plan. The plan is voluntary for other producers.

Rubber

August 25, 1942. Beginning September 1, consumption of crude rubber, latex, reclaimed rubber, and scrap rubber in all civilian products will be permitted only on specific allocations by the Director General for Operations.

This change from the previous system of rubber control, which permitted the consumption of rubber for many groups of products in accordance with average monthly consumption during a base period, is included in a revised Supplementary Order M-15-b. The revised order consolidates the original M-15-b and 13 amendments which had been issued since December, 1941.

Soda Ash

(See Caustic Soda)

Vitamin A

August 15, 1942. Price Administrator Leon Henderson stabilized prices of the natural oils and concentrates from which Vitamin A is obtained at levels substantially lower than those prevailing during the speculative flurry of late 1941.

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A Complete Check—List of Products, Chemicals, Process Industries

Resins, Plastics*

Manufacture of vinyl resin film and sheeting. No. 2,282,009. Ralph H. Talbot to Eastman Kodak Co.

Treatment of polyvinyl acetal resins. No. 2,282,026. Bozetch C. Bren, John H. Hopkins and George H. Wilder to E. I. du Pont de Nemours & Co.

Polyvinyl acetyl resins, purification and stabilization thereof. No. 2,282,057. John H. Hopkins and George H. Wilder to E. I. du Pont de Nemours & Co.

Method making and setting a bandage, which consists in covering rubber strands, while in a stretched condition, with "Vinyon" in a moist condition to form yarns with elastic cores, forming a fabric having included in its yarns the "Vinyon" yarns having elastic cores, and contracting and setting the "Vinyon" of the "Vinyon" covered cores around such elastic cores by the application of a "Vinyon" setting agent to the bandage, while in place around a part to be treated, to control the elasticity and stretch of the elastic cores. No. 2,282,274. Abby H. Weiswasser and Frederick Weiswasser.

Desulfurized polysulfide polymer and process of making. No. 2,282,287. Joseph C. Patrick to Thiokol Corp.

Natural petroleum plastic, translucent in thin layers, substantially free from asphaltenes, substantially solid at atmospheric temperature, substantially completely soluble in 86° A. P. I. naphtha, more than 75% insoluble in an equal volume of acetone at 77°F., and having a temperature susceptibility lower than that of asphaltic resins. No. 22,093. Alvin Anderson to Shell Development Co.

Insulating and refractory plastic. No. 2,282,361. Douglas Howell, Peter Gilchrist, William Ingle and Leo Crosson to Charlotte Chemical Labs. Inc.

Organic plastic material. Process and apparatus for forming articles therefrom. No. 2,282,423. William Kopitke to Plax Corp.

Printing form composed essentially of a superpolyamide. No. 2,282,448. Hans Beck and Walther Kuehne to E. I. du Pont de Nemours and Co.

Preparation of phenol-ligninaldehyde resins. No. 2,282,518. Carroll Hochwalt and Mark Plunguian to The Mead Corp.

Resinous product and method of making. No. 2,282,827. Henry Rothrock to E. I. du Pont de Nemours & Co.

Resistance tape consisting of a colloidal solid suspension of carbon black in unplasticized cellulose acetate. No. 2,282,832. Laurence Spooner to General Electric Co.

Water-soluble condensation products. No. 2,282,928. Rudolf Bauer to General Aniline & Film Corp.

Rubber*

Method baking or vulcanizing india-rubber or similar materials. No. 2,280,771. René Dufour and Henri A. Leduc.

Method producing rubber cement of low viscosity in a short time, which consists of dispersing rubber in a non-aqueous solvent therefor and boiling the dispersion under reflux in the presence of metallic copper for a period of about two hours. No. 2,281,087. Walter M. Kutz to The Raolin Corp.

In recovery of rubber from rubber bearing plants, step of subjecting plant having substantially its normal amount of liquid and its normal cellular structure to about 5,000 to 100,000 pounds pressure per lineal inch of width of the matter to which the pressure is applied to express and separate rubber therefrom in a fluid fraction by a single application of the pressure. No. 2,281,336. Matthew J. Stacom to Stacom Process Corp.

Process for producing rubber hydrochloride and the like products. No. 2,281,355. Henry F. Irving and Floyd E. Williams to Marbon Corp.

Rubber hydrohalides stabilized with aminomethyl ureas. No. 2,281,410. William J. Burke and Franklin T. Peters to E. I. du Pont de Nemours & Co.

Stable rubber hydrochloride composition. No. 2,281,436. Albert Hershberger to E. I. du Pont de Nemours & Co.

Age resistant rubber hydrochloride. No. 2,281,437. Albert Hershberger to E. I. du Pont de Nemours & Co.

Rubber hydrochloride of about 30.5% chlorine content self-sustaining film containing 10% based on the weight of rubber hydrochloride of a phenol formaldehyde-methylamine resin prepared by condensation of 1.0 mol of phenol, 2.0 mols of formaldehyde and 1.0 mol of methylamine. No. 2,281,567. Ellsworth K. Ellingboe and Paul L. Salzberg to E. I. du Pont de Nemours & Co.

Method of splicing rubber. No. 2,281,976. Merrill E. Hansen to American Anode Inc.

Double wall container, both walls being composed essentially of rubber hydrochloride the other wall being plasticized to increase its strength and the inner wall being unplasticized. No. 2,282,258. James E. Snyder to Wingfoot Corp.

Process of preserving rubber. No. 2,282,941. Clyde Coleman to United States Rubber Co.

Textiles*

In production of stiffened fabrics by uniting a plurality of layers of fabric at least one of which contains derivative of cellulose, the combination of step of rendering adhesive said derivative of cellulose, by exposure to a volatile substance selected from class consisting of solvents and latent solvents for said derivative of cellulose, said substance being applied solely in vapor form with step of uniting layers of fabric under heat and pressure immediately after the step of rendering adhesive said derivative of cellulose. No. 2,281,646. William Whitehead to Celanese Corp. of America.

Antiseptic fabric. No. 2,282,181. Roland H. Guinzburg to I. B. Kleinert Rubber Co.

Process increasing extensibility of artificial filamentary materials made of or containing an organic derivative of cellulose. No. 2,282,415. David Hadley and Thomas Jackson to Celanese Corp. of Amer.

* *Continued from last month (Vol. 537, No. 4—Vol. 538, Nos. 1, 2.)*

Process increasing extensibility of artificial filamentary materials made of or containing an organic derivative of cellulose. No. 2,282,416. David Hadley and Thomas Jackson to Celanese Corp. of Amer.

Process increasing extensibility of artificial filamentary materials made of or containing an organic derivative of cellulose. No. 2,282,417. David Hadley and Thomas Jackson to Celanese Corp. of Amer.

Method of producing threads, yarns, fabrics, and like structures comprising filaments exhibiting deep, irregular crimps without substantially weakening the filaments which comprises applying to such structures comprising artificial thermoplastic filaments a volatilizable material, and then contacting said structures, while maintaining the same free from tension, with a liquid non-solvent for said filaments, said liquid having a sufficiently elevated temperature to quickly volatilize said volatilizable material, and cause said filaments to crimp while in contact therewith, said volatilizable material having a boiling point at least 30°C. below the temperature of said liquid non-solvent. No. 2,282,568. Theoron Finzel to E. I. du Pont de Nemours & Co.

Process which comprises dyeing textile fibers, with a substantive dyestuff in a boiling dyebath, in the presence of urea. No. 2,282,724. Richard Haynn to General Aniline & Film Corp.

Continuous method of processing gray goods composed of fibers of vegetable origin. No. 2,283,141. Hans Kauffmann and Robert McEwen to Buffalo Electro-Chemical Co., Inc.

Agricultural Chemicals

Nitrogen generating chemicals. No. 2,285,843. Wendell Smith to United States Rubber Co.

Process for soil fertilization. No. 2,285,932. Floyd Leavitt to Shell Development Co.

Cellulose

Method of coagulating cellulosic solutions. No. 2,283,809. Emmette F. Izard to E. I. du Pont de Nemours & Co.

Method of making molded lignocellulosic products. No. 2,283,820. Arlie W. Schorger and John H. Ferguson to Burgess Cellulose Co.

Molded lignocellulosic material and method of making same. No. 2,283,821. Arlie W. Schorger and John H. Ferguson to Burgess Cellulose Co.

Process forming products from aqueous solutions of cellulosic material. No. 2,284,028. Leo Ubbelohde.

Tetrahydro-menaphthyl cellulose. No. 2,284,282. Winfrid Hentrich and Rudolf Kohler to The Procter & Gamble Co.

Hydrolysis of cellulosic materials. No. 2,284,500. Carl Warth to Chemische Fabrik Lowenberg Dr. Warth & Co.

Process for improving cellulose products. No. 2,284,614. Johann J. Stoeckly to North American Rayon Corp.

Resinous derivatives from cellulose and other substances and alcohols. No. 2,284,860. Eduard Farber to Polyxor Chemical Co., Inc.

Cellulose derivatives containing sulfur and nitrogen and process of making same. No. 2,284,962. Robert Haller and Alphonse Heckendorn to Society of Chemical Industry in Basle.

Manufacture of methyl cellulose. No. 2,285,514. Albert Houghton and Charles Taylor to Imperial Chemical Industries Ltd.

Mixed cellulose esters. No. 2,285,536. George Seymour and Blanche White to Celanese Corp. of America.

Ceramics, Refractories

Process for manufacture of refractory products essentially comprising magnesium orthosilicate, which comprises admixing with a batch containing such magnesium orthosilicate 1% to 10% of at least one metal as a bonding material in a finely subdivided state and capable of forming an oxygen compound coalescing with said refractory upon burning of the refractory and then preparing shapes from said mixture. No. 2,283,250. Victor Goldschmidt and Kristoffer Johannes Stenvik.

Process of manufacturing a moulded dolomite-magnesite refractory. No. 2,285,020. Mark Douglas, Alan L. Bradley and John H. Chesters.

Tempering Glass. No. 2,285,595. Jesse Littleton, Howard Lillie and William Shaver to Corning Glass Works.

Tempering Glass. No. 2,285,596. Jesse T. Littleton, Howard Lillie, William Shaver to Corning Glass Works.

Chemical Specialty

An insecticidal composition comprising walnut shell flour of smaller particle size than 100 mesh screen impregnated with rotenone as an insecticidal toxicant, and a viscous non-volatile non-drying oily carrier for the rotenone present as a surface coating on the impregnated carrier. No. 2,283,275. Forrest McLane to Stauffer Chemical Co.

Method of heating the peel of citrus fruit to remove pungent oil and other related matter from the peel and to remove the outer surface portion of the peel with the accumulated foreign matter thereon prior to obtaining the juice from the fruit. No. 2,283,290. Bailie Savage.

Organic contact insecticide and its use. No. 2,283,471. James Swaine to General Chemical Co.

Method of waterproofing and preventing efflorescence of mortar in masonry. No. 2,283,573. James Pierce to Standard Ultramarine Co.

Adhesive composition. No. 2,283,740. Hanns Klemm to Davis & Co.

Rust preventive compound. No. 2,283,931. Ernest R. Irwin.

Composition for use as a gum solvent comprising 50% to 90% refined mineral oil boiling above the boiling range of kerosene and 50% to 10% of a mixture of esters of phthalic and benzolic acids, which esters boil above 350°F. No. 2,284,080. William J. Backoff, Normal D. Williams, John F. O'Loughlin, Harry L. Moir and John S. Yule to The Pure Oil Co.

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Detergent composition. No. 2,284,086. Walter P. Ericks to American Cyanamid Co.

Quick drying intaglio marking composition. No. 2,284,276. David M. Gans to Interchemical Corp.

Quick drying intaglio marking composition. No. 2,284,277. Albert E. Gessler, David M. Gans and Paul W. Greubel to Interchemical Corp.

Quick drying intaglio marking composition. No. 2,284,279. Paul W. Greubel to Interchemical Corp.

Flux for welding copper. No. 2,284,619. Perez Epstein.

Chewing gum base comprising polybutene, a resin and a wax, the polybutene not exceeding 25% by weight of composition and there being at least as much wax as polybutene. No. 2,284,804. Frank T. De Angelis to L. A. Dreyfus Co.

Process drying a moisture containing food product. No. 2,284,913. Alfred H. McComb.

Method cementing aluminum to cellulosic material. No. 2,285,053. Floricel A. Rojas to Walter H. Liebman, Jr.

Method making fiber plaster products. No. 2,285,098. Eugene P. Schoch and William A. Cummingham.

Method of drying ink. No. 2,285,183. Dominic J. Bernardi to Interchemical Corp.

Adhesive material. No. 2,285,458. Emile Pragoff, Jr. to Hercules Powder Co.

Method making edible products and materials for use therein. No. 2,285,478. John R. White and Joseph A. Dunn to Lever Bros. Co.

Pressure-sensitive adhesive. No. 2,285,570. Corliss Cummins and Kenneth Bacon to The Dow Chemical Co.

An alkaline composition for forming cleaning baths for metal-ware with tin surfaces comprising as the essential cleaning constituents a non-caustic alkaline detergent less than 4% of a chromate salt of alkali metal and an alkali metal silicofluoride up to about 15%. No. 2,285,676. Max Metziger and Alfred Long to Blockson Chem. Co.

Coal Tar Chemicals

Sulfonated derivatives of polymerized methylstyrene. No. 2,283,236. Frank Soday to The United Gas Improvement Co.

Compounds of the cyclopentanopolyhydrophenanthrene series and a method for producing them. No. 2,283,913. Adolf Butenandt to Schering Corp.

Production of aliphatic acids. No. 2,283,920. Henry Dreyfus and Walter H. Groombridge to Celanese Corp. of Amer.

Recovery of lower aliphatic acids from their salts. No. 2,283,976. Henry Dreyfus and Walter H. Groombridge to Celanese Corp. of Amer.

Production of aliphatic acids. No. 2,283,977. Henry Dreyfus and Walter H. Groombridge to Celanese Corp. of Amer.

Aminomethyl derivatives of p-hydroxybenzoic acid salts and amides. No. 2,284,118. Louis H. Bock to Rohm & Haas Co.

Purification of coal tar bases. No. 2,284,460. Joseph H. Wells and Philip J. Wilson to Carnegie-Illinois Steel Corp.

Nuclear alkylation of amino substituted aromatic ethers. No. 2,285,243. Viktor Weinmayr to E. I. du Pont de Nemours & Co.

Manufacture of pyrrolidines. No. 2,285,413. George H. Coleman.

Process preparing alkoxy amines. No. 2,285,419. Joseph B. Dickey and Arzy R. Gray to Eastman Kodak Co.

Crystallization of hydroxycarboxylic acids. No 2,285,886. William Beck and Clement Hamblet to E. I. du Pont de Nemours & Co.

Coatings

Coating and impregnating composition. No. 2,284,570. Anthony H. Gleason to Standard Oil Development Co.

Liquid coating composition in water vehicle. No. 2,285,646. Edwin Clocker.

Methd of making coated wire fabric. No. 2,286,073. Harry Edick and Chester Wickwire to Wickwire Bros.

Dyes, Stains

Quinoline-azo compounds. No. 2,283,211. William Jones and William Baker to E. R. Squibb & Sons.

Azo compounds and material colored therewith. No. 2,283,220. James McNally and Joseph Dickey to Eastman Kodak Co.

Yellow azo dyestuffs. No. 2,283,261. Otto Kaiser to Society of Chemical Industry in Basle.

Azo dyestuffs and process of preparing same. No. 2,283,294. Fritz Straub, Peter Peith and Walter Anderau, and Walter Hanhart to Society of Chemical Industry in Basle.

Yellow azo dyestuffs. No. 2,283,326. Friedrich Felix and Willy Muller to Society of Chemical Industry in Basle.

Azo dyestuffs. No. 2,283,327. Friedrich Felix and Rudolf von Capeller to Society of Chemical Industry in Basle.

Manufacture of new azo dyestuffs. No. 2,283,667. Wilfrid H. Cliffe to Imperial Chemical Industries, Ltd.

Monazo dyestuffs soluble in water. No. 2,283,823. Adolf Siglitz and Martin Reuter to General Aniline & Film Corp.

Diazotizable azodyestuffs. No. 2,283,829. Fritz Suckfull and Heinrich Clingstein to General Aniline & Film Corp.

Vat dyestuffs of the phthaloyl carbazole series. No. 2,284,062. Walter Mieg and Franz Wieners to General Aniline & Film Corp.

Phthalimide coloring matter. No. 2,285,511. Norman Haddock to Imperial Chemical Industries Ltd.

Manufacture of soluble nitro dyestuffs and their application. No. 2,285,516. Arthur Knight and Frank Pearman to Imperial Chemical Industries Ltd.

Equipment, Apparatus

Catalytic converter. No. 2,283,208. Eugene Houdry and Thomas Prickett to Houdry Process Corp.

Apparatus for the manufacture of organic acid anhydrides. No. 2,283,209. David Hull and Claire Marshall to Eastman Kodak Co.

Process and apparatus for burning sulfur. No. 2,283,228. Albert Regenbrecht to E. I. du Pont de Nemours & Co.

Packaging and preserving dried biologicals, pharmaceuticals, and the like. No. 2,283,867. Earl W. Flosdorf and Francis J. Stokes, Jr. to F. J. Stokes Machine Co.

Acid dispenser. No. 2,284,041. Olaf L. Chapman.

Method and apparatus for soil gas analysis. No. 2,284,147. Henry N. Herrick to Standard Oil Co. of Calif.

Combination of a gas-tight container, a finely pulverulent metal selected from group consisting of titanium, zirconium, thorium and uranium in said container, the free space in said container being filled with a monatomic gas selected from group consisting of argon, helium, neon and xenon. No. 2,284,551. Peter P. Alexander.

Apparatus for separating liquids of different specific gravities. No. 2,284,737. Joseph Hirshstein to Ruth Newman and Mildred Hirshstein.

A de-linting waste puller. No. 2,284,750. John T. Landreth to Spring Packing Corp.

Gas analysis apparatus. No. 2,284,818. Thomas R. Harrison and Roscoe D. Bean to The Brown Instrument Co.

Sulfur burner. No. 2,285,170. Richard E. Pritz to E. I. du Pont de Nemours & Co.

Apparatus for treating organic material. No. 2,285,331. Frank B. Doyle to Ingersoll-Rand Co.

Vapor generator. No. 2,285,442. Howard J. Kerr to The Babcock & Wilcox Co.

Apparatus for withdrawing liquids from closed containers. No. 2,285,710. Frederick J. Harlow to Phillips Petroleum Co.

Control means for catalytic converters. No. 2,285,716. Herbert A. Hulsberg to Universal Oil Products Co.

Regeneration of catalytic materials and apparatus therefor. No. 2,285,804. Oliver Campbell and Harry Pelzer to Sinclair Refining Co.

Tool consisting of diamonds and a metallic binder, characterized by the fact that the metallic binder consists of a chemical compound of cobalt, tungsten and carbon in accordance with the formula Co_3W_3C. No. 2,285,909. Walther Dawihl to General Electric Co.

Process of dispensing liquefied gas from a tank. No 2,286,050. Robin Baker and James Fleming.

Fine Chemicals

Thiazane-3, 5-dicarboxylic acid derivatives. No. 2,283,186. Robert Coghill to Sharp & Dohme, Inc.

A mixture of alkyl derivatives of an aromatic sulfonate. No. 2,283,199. Fawrence Flett to Allied Chemical & Dye Corp.

Photographic composition containing arylides of n-heterocyclic acylacetic acids and process of developing photographic images therewith. No. 2,283,276. Edmund Middleton and Andrew Jennings to E. I. du Pont de Nemours & Co.

Process of producing an edible vitamin fortified material which comprises forming an aqueous slurry of a substantially oil-free oil-bearing seed meal, dispersing therein a material rich in a fat-soluble vitamin, drying the resulting mass and incorporating the dried mass into a food. No. 2,283,531. Andre Briod and Bernard Dombrow to National Oil Products Co.

Chemotherapeuticals in which p-amino-phenyl-arsonic acid is coupled by an azo bond to a substance selected from the group consisting of 1-naphthylamine-5-sulfonic acid, 1-naphthylamine-5-sulfonic acid-N-acetamide, 1-naphthylamine-5-sulfonamide and naphthalene-5-sulfonic acid substituted in the 1-position by an amido group of urea. No. 2,283,718. Ernst Bergmann, Felix Bergmann and Leon Haskelberg.

Detoxicant comprising at least one of the group consisting of cysteine, cystine, methionine and their soluble salts; at least one of the group consisting of hexuronic acids and their soluble salts; and at least one of the group consisting of glycine and glutamine and their soluble salts. No. 2,283,817. Gustav J. Martin and Marvin R. Thompson to William R. Warner & Co., Inc.

Plant stimulant composition containing as an essential active ingredient a naphthylalkanesulfonate and method of altering growth characteristics of plants which comprises treating with sodium 1-naphthylmethanesulfonate. No. 2,284,002. John F. Lontz to E. I. du Pont de Nemours & Co.

Mercurated aliphatic alcohols. No. 2,284,067. Anderson W. Ralston and Miles R. McCorkle to Armour & Company.

In method freeing phenthiazine from colored impurities which tend to distill therewith the steps which comprise adding a liquid consisting essentially of chlorinated diphenyl ether, distilling the liquid mixture, and thereafter separating purified phenthiazine from the distillate. No. 2,284,124. Edgar C. Britton, Frank B. Smith and Robert L. Brown to The Dow Chemical Co.

Bismuth salts of oxy acids. No. 2,284,126. Herman A. Bruson to Resinous Products & Chemicals Co.

Process reacting a para-amino-benzene-sulfofluoride, the amino group of which is unsubstituted, with a heterocyclic amine having at least one free amino hydrogen. No. 2,284,461. Bertold P. Wiesner and Ernst Katscher to Ward Blenkinsop and Co., Ltd.

Method preparation of products capable of preventing coagulation of blood, comprising extracting red alga **Delesseria sanguinea L.** with water and isolating the active material from the aqueous extract so obtained. No. 2,284,566. Horst Elsner to Schering Corp.

Polymeric carbamates and their preparations. No. 2,284,637. Willare E. Catlin to E. I. du Pont de Nemours & Co.

Process for production of krypton and xenon. No. 2,284,662. Heinrich Kahle.

Method preparing magnesium theophylline which consists in allowing theophylline to react with an ionizable magnesium compound in presence of an aqueous alkaline solution, and washing product with faintly alkaline water to dissolve out any free theophylline. No. 2,284,978. Philip A. Kober to G. H. Sherman M. D. Inc.

Preparation of 2-chloroallyl compounds. No. 2,285,329. Gerald H. Coleman and Robert W. Sapp to The Dow Chemical Co.

Method making zirconium nitrate comprising reacting an aqueous solution of nitric acid with a material taken from class consisting of zirconium tetrachloride and zirconium oxychloride and evaporating the solution thus obtained to dryness. No. 2,285,443. Charles J. Kinzie and Donald S. Hake to The Titanium Alloy Mfg. Co.

Method increasing vitamin B_1 content of a yeast, which comprises propagating "Saccharomyces cerevisae" Fleischmann 189 yeast in a wort containing synthetic vitamin B_1. No. 2,285,465. Alfred S. Schultz, Lawrence Atkin and Charles N. Frey to Standard Brands, Inc.

Manufacture of sulpho-trimellitic acid. No. 2,285,483. Max Wyler to Imperial Chemical Industries Ltd.

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Culture medium for bacteria comprising a mixture obtained by combined peptic and tryptic digestion of egg albumen casein and blood fibrin and from 0.00001 per cent. to 0.015 per cent. of boric acid. No. 2,285,708. John H. Glynn to Armour & Co.

Electrolytic process for the production of quinone and hydroquinone. No. 2,285,858. Sydney Horrobin and Randal New to Imperial Chemical Industries Ltd.

Industrial Chemicals

Zoelites and their treatment. No. 2,283,172. John R. Bates to Houdry Process Corp.

Synthetic contact masses and their preparation. No. 2,283,173. John Bates to Houdry Process Corp.

Method of preparing a contact material containing a high-swelling bentonite and an adsorptive clay. No. 2,283,174. John Bates and George Bond, Jr. to Houdry Process Corp.

Method of utilizing emulsions. No. 2,283,192. Marvin Ditto to Emulsions Process Corp.

Washing, wetting and emulsifying agent. No. 2,283,214. Lucas Kyrides to Monsanto Chemical Co.

Process for precooling and prepurifying a gaseous mixture. No. 2,283,232. Paul Maurice Schuftan to The British Oxygen Co., Ltd.

Process of preparing halogenated saturated aliphatic nitriles which comprises passing a gaseous mixture containing the vapor of a saturated aliphatic nitrile and a member of the group consisting of a chlorine and bromine through a reaction zone at a temperature of 250 to 550°C. No. 2,283,237. Le Roy Spence and Darrel Butterbaugh to Rohm & Haas Co.

Hydrocarbon gas conversion process. No. 2,283,305. Malcolm Youker to Phillips Petroleum Co.

Liquid composition for use with an aqueous solution of a peroxide for the bleaching of hair comprising an oleaginous solution of an aliphatic amine and an emulsifying agent. No. 2,283,350. Nathaniel Baum to McLaughlin & Wallenstein.

Process of forming substantially dustless agglomerates of carbon black, the novel steps of extruding a paste of substantially equal parts by weight of water and carbon black to form columnar segments having smooth sides and rough and irregular ends, thereafter tumbling the wetted segments to form smooth substantially hemispherical ends thereon, and thereafter drying said tumbled segments. No. 2,283,364. Hilding Hanson and Robert Skoog to United Carbon Co., Inc.

Process for preparing degradation products of sterols comprising the oxidation of cholestenone by a member of the group consisting of: oxygen gas, air, in the presence of vanadium-pentoxide at temperatures of 120-160°C., and separating said sterol degradation products from the formed oxidation mixture. No. 2,283,411. Herman Bretschneider and Laszlo Fari to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara R. T.

Sulfonated organic compounds as capillary-active media. No. 2,283,437. Winfrid Hentrich, Carl Albert Lainau, and Wilhelm Jakob Kaiser to The Procter & Gamble Co.

Capillary active compound and method of producing the same. No. 2,283,438. Winfrid Hentrich, Carl Lainau, Wilhelm Kaiser to The Procter & Gamble Co.

Process for separating unsaponifiable substances from their mixable substances. No. 2,283,456. Hermann Pardun to Noblee & Thorl G. m. b. H.

Process for producing alkalated phenols which comprises alkylating a phenol with an unsaturated aliphatic hydrocarbon containing two double bonds in the presence of a solid mixture comprising essentially an acid of phosphorus and an absorbent carrier and at a temperature of from about 100°C. to about 300°C. No. 2,283,465. Raymond Schaad to Universal Oil Products Co.

Pigmented oil gel and method of making. No. 2,283,518. William Waldie to The Commonwealth Engineering Co. of Ohio.

Pigmented fatty acid glyceride gel and method of making. No. 2,283,519. William Waldie to The Commonwealth Engineering Co. of Ohio.

Pigmented resin gel and method of making. No. 2,283,520. William Waldie to The Commonwealth Engineering Co. of Ohio.

In method of removing a section of well casing comprised essentially of a ferrous metal with a highly corrosive chemical solution which boils when chemically dissolving a ferrous metal, the steps which consist in filling the casing with the corrosive chemical solution adjacent the section to be removed, and thereafter applying pressure upon the corrosive chemical solution in an amount sufficient to prevent the solution from boiling. No. 2,283,563. Orlin Lyons to The Dow Chemical Co.

Mud for use in oil and gas wells, comprising a suspending agent of nontronite and a sealing agent of preflocculated (large particle size) Colorado clay. No. 2,283,564. Eidon Means to William Carpenter.

Lubricating compound composed of 94% of an oily base and containing 3% of zinc sulfide well dispersed therein, 3% of barium sulfate for retarding the decomposition of the zinc sulfide by overheating between movable parts of machinery. No. 2,283,581. Sebastian Scalzitti to The Belt Grip Co.

Agent for accentuating perfumes and food flavors and process for producing the same. No. 2,283,589. Charles H. Stuart.

A grease comprising an aluminum soap of higher saturated fatty acid, a mineral oil and a relatively small amount of substance selected from group consisting of hydrogenated castor oil and 12-hydroxy stearic acid. No. 2,283,602. George W. Fiero.

Composition comprising 20 to 50% calcium sulfate binder, 50 to 80% filler, and .05 to 10% of cadmia. No. 2,283,611. Robert Neiman to Edmund A. Steinbock.

High molecular weight halogen- and sulfur-containing derivatives of hydrocarbon polymers. No. 2,283,627. Anthony H. Gleason to Jasco, Inc.

Refrigerant comprising a fluorochloro hydrocarbon and small amount of oenanthal. No. 2,283,666. William S. Calcott to Kinetic Chemicals Inc.

Process for isolation of a long-chain aliphatic aminoacyl compound which comprises treating the crude compound with an aqueous solution of an organic acid present in at least stoichiometric proportions with respect to said long-chain aliphatic aminoacyl compound, filtering the resulting mixture and precipitating the desired aminoacyl compound from the filtrate by treating same with an alkaline agent. No. 2,283,683. Elmore L. Martin to E. I. du Pont de Nemours & Co.

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Process for molding colloidal matters. No. 2,283,688. Paul L. Mergier and Pierre E. Leroy.

Process for calcining precipitated calcium carbonate and recovering CO_2 gas therefrom. No. 2,283,758. Robert D. Pike.

Esterlike condensation products and a process of preparing them. No. 2,283,764. Johann Rosenbach and Gerhard Balle to General Aniline & Film Corp.

Process of making soap. No. 2,283,776. Benjamin H. Thurman to Refining, Inc.

Control of endothermic and exothermic catalytic reactions. No. 2,283,832. Charles L. Thomas to Universal Oil Products Co.

Method producing alumina. No. 2,283,849. Henry L. Coles to William Sokolec and Howard W. Dix.

Purification of metal halide fluxes. No. 2,283,884. Charles E. Nelson to The Dow Chemical Co.

Method treating unsaturated ketones containing aldehyde. No. 2,283,911. Joseph H. Brant and Benjamin Thompson to Eastman Kodak Co.

Paving compound comprising a mineral aggregate coated with a water-soluble salt selected from the group consisting of silver, copper, aluminum and iron groups and bonded with an asphalt containing a wetting agent selected from the group consisting of oxidized paraffin wax bottoms, tar still pitch, degras, calcium naphthenate, zinc naphthenate, and lead naphthenate. No. 2,283,937. Charles Mack to Standard Oil Development Co.

Separation of sulfuric acid from carboxylic acids. No. 2,283,991. William H. Hill to American Cyanamid Co.

Emulsifiable composition and method of preparing same. No. 2,284,023. Edward W. Scripture, Jr.

Plasticized waxes. No. 2,284,065. Robert J. Myers to The Resinous Products & Chemical Co.

Manufacture of melamine. No. 2,284,079. Andrews C. Wintringham and Victor L. King to American Cyanamid Co.

Process treating mineral oil materials containing refractory water-in-oil emulsions. No. 2,284,106. Bert A. Stagner.

Process for purifying sugar solutions. No. 2,284,122. Robert Boyd.

Esters of polyglycerol. No. 2,284,127. Herman A. Bruson to Rohm & Haas Co.

A terpene substituted phenol the phenolic hydroxyl group of which is esterified with a carboxylic acid. No. 2,284,156. Fritz Lemmer and Kurt Hultzsch to The Resinous Products & Chem. Co.

Corrosion inhibition. No. 2,284,241. James H. Werntz to E. I. du Pont de Nemours & Co.

Hydrous alkali metal silicates. Manufacture of shaped articles therefrom. No. 2,284,248. Chester L. Baker and Charles H. Dedrick to Philadelphia Quartz Co.

Ethers of protocatechuic aldehyde. No. 2,284,287. Lucas P. Kyrides to Monsanto Chemical Co.

Hydrogenated cardanol and methods of making same. No. 2,284,369. Solomon Caplan to The Harvel Corp.

Preparation of peracids. No. 2,284,477. Joseph S. Reichert, Samuel A. McNeight and Arthur A. Elston to E. I. du Pont de Nemours & Co.

Catalytic halogenation of unsaturated organic compounds. No. 2,284,479. Frederick F. Rust and William E. Vaughan to Shell Development Co.

Halo-substitution of mixtures containing saturated organic compounds. No. 2,284,482. Wm. E. Vaughan and Frederick F. Rust to Shell Development Co.

Process for hydrogenation of adiponitrile. No. 2,284,525. Arthur W. Larchar and Howard S. Young to E. I. du Pont de Nemours & Co.

Process decolorizing solutions. No. 2,284,593. Max Seidel.

Soya bean product. No. 2,284,700. Eric Wahlforss to The Glidden Co.

Flexible abrasive web of felted fibrous materials impregnated with suitable adhesive binder and having abrasive grain distributed internally of the web, said web having an abrasive grain content progressively greater from one surface of the web to the opposing web surface. No. 2,284,715. Raymond C. Benner and Romie L. Melton to The Carborundum Co.

Process manufacturing flexible abrasive webs. No. 2,284,716. Raymond C. Benner and Romie L. Melton to The Carborundum Co.

Pickling agent for removing scale and metal oxides from surface of copper-beryllium alloys, said agent consisting of an aqueous solution containing caustic alkali and alkali cyanide. No. 2,284,743. Henry C. Kawecki and Wayne E. Martin to The Beryllium Corp.

Adhesive and method of making. No. 2,284,800. John W. Close to United Wall Paper Factories, Inc.

Method preserving potency of seasoning for meats comprises absorbing a small amount of essential oils, in an insoluble carrier so as to prevent immediate release of essential oils upon contact with meat surfaces, said carrier consisting of dry comminuted white pepper and ginger which function by absorption to protect the essential oils against oxidation before use. No. 2,284,822. Albert Heller to B. Heller & Co.

Coagulant for water treatment which comprises a mixture of an alkali metal aluminate and bentonite. No. 2,284,827. Frederick K. Lindsay and John W. Ryznar to National Aluminate Corp.

Process manufacturing molded non-metallic resistances consisting of complex heavy metal oxygen compounds. No. 2,284,858. Karl Biefeld and Edouards Krebs.

Recovery of certain metal salts. No. 2,284,861. Eduard Farber to Polyxor Chem. Co., Inc.

Method preventing growth of algae in water pools, cooling towers, spray condensers and the like which consists in immersing a body of copper naphthenate in water to be treated. No. 2,284,889. Gerald M. Fisher to Socony-Vacuum Oil Co.

Method of growth control and carrier. No. 2,284,970. George S. Avery, Jr. to The Dow Chemical Co.

Dehumidifying composition capable of being reactivated after use, by application of heat, to restore moisture absorbent and adsorbent properties thereof consisting of activated bauxite impregnated with manganous chloride. No. 2,284,981. Henry A. Martin and Carl V. Spangler to J. F. Pritchard & Co.

Rosin size emulsion. No. 2,285,028. Edmund A. Georgi and Arthur L. Osterhof to Hercules Powder Company.

Process preparing aldehydes. No. 2,285,059. John T. Scanlan and Daniel Swern to Henry A. Wallace.

In making mixture of two inorganic water-soluble crystalloid materials, the method which comprises forming a solution of two materials in water, dispersing the solution in a liquid that is volatile at the temperature of boiling of the solution, immiscible therewith, and substantially a non-solvent for the said materials, and then evaporating said liquid and water from the dispersion. No. 2,285,093. Vaman R. Kokatnur.

Process for refining montan wax. No. 2,285,100. Kurt Stickdorn to Unichem Chemikalienhandels A.-G.

Method making titanium oxygen compound. No. 2,285,104. David W. Young to General Chemical Co.

In process manufacturing alcohol, the step of adding not sprouted millet flour containing yeast to the mash, thereby accelerating the alcoholic fermentation and increasing the yield in alcohol. No. 2,285,130. Herman Schwarca to Julian J. Wittal.

Insect control composition containing as an essential active ingredient a 2-alkenyl thiocarbamide of an amine selected from class consisting of aromatic and cycloaliphatic amines. No. 2,285,184. Euclid W. Bousquet and Hubert G. Guy to E. I. du Pont de Nemours & Co.

Manufacture of barium sulfate. No. 2,285,242. Isaac E. Weber and William S. Wood.

Noble metal catalyst and process of preparing same. No. 2,285,277. Clyde O. Henke, Roland G. Benner and Robert C. W. Jones to E. I. du Pont de Nemours & Co.

In art of gravel-packing wells, the process comprising introducing gravel by an emulsion at least one of whose phases is soluble in petroleum. No. 2,285,291. Delmar H. Larsen to National Lead Co.

Process purifying aqueous solution of alkali metal hydroxide. No. 2,285,299. Irving E. Muskat and Fred D. Ayers to Pittsburgh Plate Glass Co.

Method preparing concentrated sodium hydroxide. No. 2,285,300. Irving E. Muskat to Pittsburgh Plate Glass Co.

Soap comprising saponified hydrogenated rosin which is saturated by combination with hydrogen to an extent from about 60 to about 95 per cent of the theoretical for two double bonds of its unsaturated rosin acid radicals and a saponified fatty acid. No. 2,285,333. Irvin W. Humphrey to Hercules Powder Co.

Process of producing sulfonated products. No. 2,285,337. Roland Kapp and Everett T. Woods to National Oil Products Co.

Phthalocyanine sulfonic acids. No. 2,285,359. George Rosch, Otto Bayer and Hans Hoyer to General Aniline & Film Corp.

Process reacting mixture of water and an alcohol with a dicyclic unsaturated terpene compound in presence of a suitable acidic catalyst, whereby a mixture of a terpene alcohol and a terpene ether is obtained, and recovering the terpene alcohol and terpene ether from reaction mixture. No. 2,285,366. Donald H. Sheffield to Hercules Powder Co.

System for manufacturing sulphonic acids. No. 2,285,390. Robert L. Brandt to Colgate-Palmolive-Peet Co.

Process for manufacture relatively finely divided composite of silica hydrogel and alumina hydrogel. No. 2,285,396. Joseph D. Danforth and Charles L. Thomas to Universal Oil Products Co.

Pest control composition containing as an essential active ingredient a 1, 2, 4-dithiazole. No. 2,285,409. Euclid W. Bousquet, Ellsworth K. Ellingboe and Hubert G. Guy to E. I. du Pont de Nemours & Co.

Pest control composition containing as an essential active ingredient a 1, 2, 4-thiadiazole. No. 2,285,410. Euclid W. Bousquet and Hubert G. Guy to E. I. du Pont de Nemours & Co.

An emulsion of an organic water-repellent material and aqueous material including a portion of a glycerol, a member of group consisting of sugars and sugar alcohols, and a member selected from group consisting of sugars and sugar derivatives only partially esterified with an aliphatic acid containing at least eight carbon atoms. No. 2,285,422. Albert K. Epstein and Benjamin R. Harris.

Production of ethylene glycol which comprises hydrogenating an aliphatic alcohol ester of a partially dehydrated glycolic acid while in contact with a hydrogenation catalyst at a temperature between 125 and 325° C. and a pressure in excess of 400 atmospheres. No. 2,285,448. Donald J. Loder to E. I. du Pont de Nemours & Co.

Aqua sol composed of a colloidal inorganic oxide, an organic solvent and water, which comprises forming an aquasol containing a dissolved inorganic salt and a colloidal inorganic oxide, adding a quantity of water-miscible organic solvent and removing the precipitated inorganic salt. No. 2,285,449. Morris D. Marshall to Monsanto Chemical Co.

Preparation of phosphorus. No. 2,285,464. Robert F. Ruthruff.

Hydrohalogenation process. No. 2,285,473. Charles A. Thomas and Herbert E. Morris to Monsanto Chemical Co.

Method preparing relatively stable sol which comprises forming an aquasol containing a dissolved inorganic salt and a colloidal inorganic oxide, cooling said aquasol until a major proportion of said salt precipitates out, then removing precipitated salt. No. 2,285,477. John F. White to Monsanto Chemical Co.

Felted article and process for its production. No. 2,285,490. Aubrey Broderick to Carbide & Carbon Chemicals Corp.

Production of ethylene glycol which comprises hydrogenating an aliphatic alcohol ester of a partially dehydrated glycolic acid while in contact with a hydrogenation catalyst at a temperature between 125 and 325° C. and a pressure in excess of 400 atmospheres. No. 2,285,448. Donald Loder to E. I. du Pont de Nemours & Co.

Method of preparing a stable organoaqua sol composed of a colloidal inorganic oxide, an organic solvent and water, which comprises forming an aquasol containing a dissolved inorganic salt and a colloidal inorganic oxide, adding a quantity of a water-miscible organic solvent and removing the precipitated inorganic salt. No. 2,285,449. Morris Marshall to Monsanto Chemical Co.

Process of manufacturing filaments of polymeric hexamethylene adipamide of circular cross section, which comprises extruding molten polymer through a circular orifice into a quenching liquid having substantially no solvent action on said polymer and maintained at a temperature of 35° C. to 45° C. No. 2,285,552. Johannes Alfthan to E. I. du Pont de Nemours & Co.

Substituted dihydroxy-diphenyls. No. 2,285,563. Edgar Britton and John Livak to The Dow Chemical Co.

Zinc chloride recovery from galvanizer's salammoniac skimmings. No. 2,285,573. Samuel Dubs to Morris Kirk & Son Inc.

An aqueous emulsion stable at temperatures above 80° C. and adapted for waterproofing fabrics, which comprises paraffin emulsified in an aqueous solution comprising water, soap and a salt of a polymerized carboxylic acid selected from the group consisting of acrylic, methacrylic and maleic acids and a water-soluble salt of a hevay metal. No. 2,285,579. Erich Groner to Rohm & Haas Co.

Oxidation of alicyclic hydrocarbons. No. 2,285,601. Sumner McAllister, to Shell Development Co.

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α-Phenylethyl substituted alkoxyphenol. No. 2,285,625. Fred Taylor and John Livak to The Dow Chemical Co.

Substituted phenol. No. 2,285,626. Fred Taylor and John Livak to Dow Chemical Co.

Method of producing a purified gum rosin and turpentine from crude oleoresin. No. 2,285,628. William Traylor to Hercules Powder Co.

Process of purifying water. No. 2,285,750. Robert C. Swain to American Cyanamid Co.

Process treating a zein body to give it resistance to water and other liquids which consists in bringing said body containing a zein solvent into contact with steam. No. 2,285,758. Oswald C. H. Sturken to Corn Products Refining Co.

Chemical Substances. No. 2,285,773. Benjamin R. Harris to Colgate-Palmolive-Peet Co.

Solvent extraction of glycerides. No. 2,285,795. Augustus Batchelder to Standard Oil Co. of Calif.

Process for treatment of organic matter by fermentation. No. 2,285,834. Douglas McIntyre Proctor to Mitchell Engineering Ltd.

Method of producing abrasive metal carbides. No. 2,285,837. Raymond Ridgway to Norton Company.

Water-swelling nonfibrous pellicle with a waterproof coating. No. 2,285,852. Ralph Cornwell and Charles Rosser to Sylvania Industrial Corp.

Waste sulphite liquor recovery. No. 2,285,876. George Tomlinson.

Composition containing metal deactivators and the method of preparing the same. No. 2,285,878. Ellis White and Ernest Walters to Shell Development Co.

Process for extraction. No. 2,285,898. Albert Caselli and Alan Nixon to Shell Development Co.

Treatment of black liquor soap and the like. No. 2,285,902. Ludwig Christmann and Alfred Houpt to American Cyanamid Co.

Oxidation of cyclohexanol. No. 2,285,914. Otto Drossbach to E. I. du Pont de Nemours & Co.

Polymerization of olefins with phosphoric acid catalyst. No. 2,285,920. William Gage to Shell Development Co.

Sound-deadening material and method. No. 2,285,924. Gustaf Halfvarson to Westinghouse Electric & Manufacturing Co.

Nonfoaming emulsifiable oils. No. 2,285,940. Otto Norring to Shell Development.

Reaction product of a tertiary amine with the compound formed from the reaction of a nitrile containing a chain of more than 9 carbon atoms, an acid chloride containing a chain of more than 9 carbon atoms and formaldehyde. No. 2,285,948. John Rust to Ellis-Foster Co.

Method of dispersing rotenone, rotenone bearing resins, compounds related to rotenone and the resin from which the rotenone has been removed, which consists in depositing a solution of any of these insecticides onto a surface heated at a temperature between 300° C.-500° C., thereby releasing the insecticides in the form of a smoke. No. 2,285,950. William Sullivan and Lyle Goodhue to the free use of the People in the Territory of the U. S.

Water treating composition comprising a dry mixture including major proportions of pulverulent high volatile coal and minor but substantial proportions of ferric sulfate, sodium silicate and a sodium phosphate. No. 2,285,992. Rowland Magill to Peabody Coal Co.

Preparation of substituted aldehydes. No. 2,286,034. William Gresham to E. I. du Pont de Nemours & Co.

Process for the preparation of substituted glyceric aldehydes. No. 2,286,037. Donald Loder to E. I. du Pont de Nemours & Co.

Gel Intermediate. No. 2,286,038. Willett Pierson to William H. Anderson.

Process dehydrating wet phenols which comprises distilling the wet phenols in the presence of xylene in an amount sufficient to form an azeotropic mixture with the phenol and water so as to effect removal of water from the phenols. No. 2,286,056. William Brown to Allied Chemical & Dye Corp.

Process for copolymerizing maleic anhydride and polymerizable vinyl compounds. No. 2,286,062. Fred Condo and Charles Krister and William Lundquist to E. I. du Pont de Nemours & Co.

Wax decomposition inhibitor. No. 2,286,112. Albert Schilling and George Latham to Remington Arms Co. Inc.

In process for producing monomeric glyoxal the step comprising triturating glyoxal sulfate in an aqueous medium with a sparingly soluble carbonate of a metal having an insoluble sulfate. No. 2,286,125. Michael Sveda to E. I. du Pont de Nemours & Co.

Aromatic substituted methyl esters of hydrazoic acid as insecticides. No. 2,286,169. Ingenuin Hechenbleikner to American Cyanamid Co.

Leather

Method and composition for degreasing skins. No. 2,283,421. Fritz-Carl Castendyk.

Process of fatliquoring leather which comprises treating the leather with an emulsion of a sulfated oil having a pH value between about 5 and about 6, and containing between about 0.5% and about 5% of an organic nitrogen compound selected from the group consisting of amides, thiamides, and reaction products thereof with constituents of the sulfated oil. No. 2,283,540. Gifford Davis and Ralph Porter to National Oil Products Co.

Metals, Alloys

Article of manufacture formed of stainless steel having substantially integral with the surface thereof in certain zones only, an extremely thin, but coherent and tenaciously adherent film of color containing oxides of iron and chromium; said colored zones being so correlated and disposed with respect to the other zones of said surface as to form a predetermined design. No. 2,283,171. Clements Batcheller to Allegheny Ludlum Steel Corp.

For extracting gold from ores which have not been previously roasted and in which a major gold-bearing constituent is a gold telluride, a process involving leaching the ore with a solvent containing free ammonia, an alkali or alkaline earth cyanide, and a sufficient amount of a compound of divalent copper to give the solution a distinct blue color. No. 2,283,196. Colin Fink and Garth Putnam.

Process of extracting gold from its ores which comprises the step of leaching the ore with a solvent prepared by adding free chlorine to a solution containing a bromide and a large excess of a chloride salt. No. 2,283,198. Colin Fink and Garth Putnam.

Method for production of irons and steels. No. 2,283,299. Morman Tisdale to Molybdenum Corp. of America.

Manufacture of iron and steel by the open hearth process. No. 2,283,622. James J. Bowden and John S. Suda.

Graphitic steel. No. 2,283,664. Frederick R. Bonte to The Timken Roller Bearing Co.

Method preventing intergranular oxidation in ternary beryllium alloys. No. 2,283,675. Richards H. Harrington to General Electric Co.

Method producing chromium-nickel stainless steels. No. 2,283,902. John Wulff to The Chemical Foundation Inc.

Method of nickel plating. No. 2,284,629. Edwin M. Baker to Houdaille-Hershey Corp.

Method making hardenable carbon steel. No. 2,284,638. Frances H. Clark and Robert F. Dirkes.

Hard metal body. No. 2,285,205. Josef Hinnuber to General Electric Co.

Process beneficiating metalliferous ores which comprises admixing ground ore with a reagent prepared by reacting sulphonated castor oil with at least 1.1 times its weight of an alkali carbonate and separating in an aqueous pulp the mineral values from the ore. No. 2,285,394. Hugh W. Coke.

Hot worked alloy capable of developing magnetic properties including high coercive force and high remanence suitable for permanent magnets comprising about 5% to 9.5% aluminum, 1% to 3% titanium, 20% to 30% nickel, and the balance iron. No. 2,285,406. Clarence G. Bieber to The International Nickel Co.

Method producing white matte finish on aluminum and aluminum base alloys. No. 2,285,468. Charles J. Slunder to Aluminum Company of America.

Method of and apparatus for producing sponge iron. No. 2,285,487. Joseph Batie to Kelsey-Hayes Wheel Co.

Process for electrodepositing an adherent coating of copper on chromium—containing alloys of iron and/or nickel. No. 2,285,548. Andrew Wesley to The International Nickel Co. Inc.

Process of electrodepositing an adherent layer of copper from copper refinery electrolyte on alloys of iron and/or nickel containing chromium. No. 2,285,549. Andrew Wesley and Harry Copson to International Nickel Co. Inc.

Electrodeposition of copper powder. No. 2,285,762. Sidney B. Tuwiner and William H. Osborn to Phelps Dodge Corp.

Magnesium base alloy containing from 1 to 15 per cent of cadmium, from 0.01 to 1 per cent of cerium, from 0.3 to 8 per cent of zinc, from 0.01 to 3 per cent of manganese, and the balance being magnesium. No. 2,285,822. John McDonald to The Dow Chemical Co.

Process of removing cadmium from white metals, which comprises melting the metal to be treated, admixing therewith sulfur to form a dross containing cadmium skimming off the dross from the purified metal. No. 2,286,017. Carleton Smith to National Lead Co.

Paints, Pigments

Varnish composition comprising as an ingredient the product of the reaction of a liquid derivative of a rosin, said derivative having a conjugated system of double bonds in the rosin nucleus, an unmodified oil-soluble phenol-aldehyde resin and a drying oil at a maximum temperature within the range of about 320°F. to about 600°F. No. 2,283,353. Irwin Clare to Hercules Powder Co.

Varnish manufacture. No. 2,283,872. Malcolm F. Pratt, Thomas L. Apjohn and John Happel to Socony-Vacuum Oil Co., Inc.

Pigment treatment. No. 2,284,585. Ray L. McCleary to E. I. du Pont de Nemours & Co.

Preparation of phthalocyanine pigments. No. 2,284,685. Stanley R. Detrick and Robert T. Diver to E. I. du Pont de Nemours & Co.

Production of improved titanium pigments. No. 2,284,772. George R. Seidel to E. I. du Pont de Nemours & Co.

Method of manufacturing chrome yellow pigments. No. 2,285,115. David M. Gans and Clinton Grove to Interchemical Corp.

Process for production of titanium dioxide. No. 2,285,485. Jelks Barksdale and Walter W. Plechner to National Lead Co.

Preparation of titanium dioxide pigments. No. 2,285,486. Jelks Barksdale and Walter W. Plechner to National Lead Co.

Paper, Pulp

Paper having on at least one side thereof a coating comprising a thermoplastic resin made from a dihydric dinuclear hydroaromatic alcohol blended with ethyl cellulose, a wax and a plasticizer. No. 2,285,095. David A. Rothrock and Harold C. Cheetham to The Resinous Products & Chemical Co.

Petroleum

In catalytic polymerization of olefin hydrocarbons, the improvement which comprises passing an olefin-containing hydrocarbon mixture down through a mass of a granular silica-alumina polymerization catalyst under polymerizing conditions of temperature and pressure, the said granular silica-alumina catalyst having been graded as to size and disposed in a polymerization chamber with finer particles at the bottom and coarser particles at the top. No. 2,283,499. Karl Hachmuth to Phillips Petroleum Co.

Cyclic process for manufacture of high anti-knock motor fuel from low-boiling hydrocarbons containing isobutane, normal butane and olefins. No. 2,283,603. Arthur R. Goldsby and Frank H. Bruner to The Texas Company.

Hydrocarbon conversion process. No. 2,283,851. Roland B. Day and Elmer R. Kanhofer to Universal Oil Products Co.

Production of Isoparaffins. No. 2,283,852. Gustav Egloff to Universal Oil Products Co.

Conversion of hydrocarbon oils. No. 2,283,854. Bernard S. Friedman and Wayne L. Benedict to Universal Oil Products Co.

Refining petroleum hydrocarbons to produce gasoline. No. 2,284,204. William T. Hancock.

Lubricating composition comprising a mineral lubricant and a small amount of oleone. No. 2,284,258. Benjamin T. Brooks to American Cyanamid & Chem. Co.

Stabilization of nonviscous cracked petroleum distillates. No. 2,284,267. Frederick B. Downing and Charles J. Pedersen to E. I. du Pont de Nemours & Co.

Process sweetening sour hydrocarbon oils. No. 2,284,271. Leslie U. Franklin and Walter H. Weeks to Gulf Oil Corp.

Process sweetening light petroleum distillates. No. 2,284,272. Leslie U. Franklin, Walter H. Weeks and Jack W. Harris to Gulf Oil Corp.

Process for sweetening sour hydrocarbon oils. No. 2,284,273. Leslie U. Franklin to Gulf Oil Corp.

Hydrohalogenation of unsaturated hydrocarbons. No. 2,284,467. Seaver A. Ballard to Shell Development Co.

Hydrocarbon synthesis. No. 2,284,468. Robert E. Burk and Everett C. Hughes to The Standard Oil Co.

Combination petroleum cracking operation. No. 2,284,493. Henry D. Noll and Otis L. Branson to Socony-Vacuum Oil Co.

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Nitrated petroleum phenol composition. No. 2,284,523. Henry B. Kellog and Peter J. Gaylor to Standard Oil Development Co.

Condensation catalysts of increased activity and process producing same. No. 2,284,554. Fred J. Beyerstedt to Standard Oil Development Co.

Continuous method forming from a relatively high boiling petroleum oil fractions of lower boiling range than original oil. No. 2,284,581. Paul E. Kuhl to Standard Oil Development Co.

Process treating hydrocarbon oils with light hydrocarbons. No. 2,284,583. Warren K. Lewis to Standard Oil Development Co.

Regeneration of contact masses. No. 2,284,584. Homer Z. Martin to Standard Oil Development Co.

Refining of mineral oils. No. 2,284,592. Walter H. Rupp and Kenneth E. Thorp to Standard Oil Development Co.

Process for catalytic conversion of hydrocarbons. No. 2,284,603. Arnold Belchetz and Duncan K. Finlayson to M. W. Kellogg Co.

Method of dewaxing oil. No. 2,284,607. Courtenay D. Marshall to Socony-Vacuum Oil Co.

Recovery of gasoline from natural gas. No. 2,284,973. Walter C. Dayhuff and John E. Laurance to Standard Oil Co. of California.

Petroleum refining. No. 2,285,190. Wallace A. Craig and Paul C. Rich to Richfield Oil Corp.

Shale oil distillation. No. 2,285,276. Charles E. Hemminger to Standard Oil Development Co.

Process reforming naphtha to improve antiknock quality thereof, which comprises contacting said naphtha, under reforming conditions of temperature and pressure with a catalyst consisting of aluminum oxide and an alkali metal borate. No. 2,285,294. Ernest M. Marks to The Atlantic Refining Co.

Process cementing oil wells. No. 2,285,302. Gordon D. Patterson to E. I. du Pont de Nemours & Co.

Process producing catalysts which comprises suspending silica hydrogel in an aluminum salt solution, adding a volatile basic precipitant to precipitate hydrated alumina, and drying the resultant silica-alumina composite. No. 2,285,314. Charles L. Thomas and Jacob E. Ahlberg to Universal Oil Products Co.

Lubricant of the class consisting of oil and grease bases, said lubricant having a base which constitutes at least 85% of the lubricant and contains finely divided, unsaponified basic lead carbonate dispersed therein to the extent of not less than 3½" nor more than 15% by weight. No. 2,285,452. George E. Merkle to Lubriplate Corp.

Lubricant of class consisting of oils and greases containing, as a well-reducing agent, finely divided titanium dioxide dispersed therein to extent of not more than 10½% by weight. No. 2,285,453. George E. Merkle to Lubriplate Corp.

Lubricant of the class consisting of oil and grease bases, said lubricant having a base which constitutes at least 85% of the lubricant and contains finely divided, unsaponified, basic lead carbonate dispersed therein to the extent of not less than 3½% nor more than 15% by weight. No. 2,285,452. George Merkle to Lubriplate Corp.

Lubricant of the class consisting of oils and greases containing, as a wear-reducing agent, finely divided titanium dioxide dispersed therein to the extent of not more than 10½% by weight. No. 2,285,453. George Merkle to Lubriplate Corp.

Treatment of hydrocarbon oils. No. 2,285,606. Charles Nofsinger and Joseph Jewell to Gasoline Prods. Co. Inc.

Process for desulphurizing mineral oil distillates. No. 2,285,696. Clarence L. Dunn to Shell Development Co.

Treatment of gasoline. No. 2,285,727. Fasili L. Komarewsky to Universal Oil Products Co.

Lubricant of class consisting of oils and greases containing finely-divided zinc sulphide dispersed therein to an extent of not over 12% by weight, and characterized by its freedom from ingredients which would cause progressive abrasive action on wearing surfaces to which it is applied. No. 2,285,739. George E. Merkel to Lubriplate Corp.

Process for coalescing hot foamy oil withdrawn from a vaporizer comprising forming body of said foamy oil into thin layer of increased area and contacting said thin layer of hot foamy oil with a spray of cool oil. No. 2,285,744. Edward G. Ragatz to Union Oil Co. of California.

Non-corrosive lubricating oil composition comprising dissolved small amount of substance selected from group consisting of di-alpha naphthyl ether and phenyl alpha naphthyl ether. No. 2,285,752. Paul R. Van Ess to Shell Development Co.

Treatment of hydrocarbons. No. 2,285,785. Jean Seguy to Universal Oil Prods. Co.

Lubricant for metallic bearing surfaces consisting of a major proportion of a petroleum lubricating oil and a minor amount of an acid ester of a sulfur-free acid of phosphorus. No. 2,285,853. Frederick Downing, Anthony Benning and Frank Johnson to E. I. du Pont de Nemours & Co. Inc.

Lubricant for metallic bearing surfaces consisting of a major proportion of a mineral lubricating oil and a minor amount of an aliphatic ester of a sulfur-free acid of phosphorus. No. 2,285,854. Frederick Downing, Anthony Benning and Frank Johnson to E. I. du Pont de Nemours & Co.

Lubricant consisting of a hydrocarbon oil and a small quantity of an aryl ester of phosphorus acid. No. 2,285,855. Frederick Downing and Anthony Benning and Frank Johnson to E. I. du Pont de Nemours & Co.

Catalysis for manufacturing gasoline hydrocarbons of high antiknock characteristics. No. 2,286,129. Preston Veltman to The Texas Co.

Resins, Plastics

Process of making a resinous condensation product, comprising heating hemicelluloses with a phenol as the only reactants in the presence of a catalyst. No. 2,283,458. **Max Phillips.**

Method for manufacture of solid polymers of vinyl aromatic compounds. No. 2,283,539. William Collings, Donald Gibb and Gordon Schmetler to The Dow Chemical Co.

Process producing resins of sulfur dioxide-olefin type. No. 2,283,900. Maxwell M. Barnett to Freeport Sulphur Co.

Composition of matter for forming a polymerized plastic suitable for use as an electrical insulating material, comprising an intimate mixture of styrene, not more than about 0.5% of benzoyl peroxide polymerization accelerator and not more than about 2% of dibutylphthalate which functions first as a plasticizer and then to harden the composition. No. 2,284,335. Erich O. Meyer to Consolidated Edison Co. of New York.

Thermo-plastic of character described comprising following ingredients in proportions states: sulfur parts 24-45; aluminum stearate 2-6; powdered silica 5-9; wood flour 3-7; sugar 1-2; rubber 1-4. No. 2,284,432. James A. Kennedy .

Copolymer containing ethylidene diacrylate or dimethacrylate. No. 2,284,639. Loring Coes Jr. to E. I. du Pont de Nemours & Co.

Process making polymeric products and for modifying polymeric products. No. 2,284,896. William E. Hanford and Donald F. Holmes to E. I. du Pont de Nemours & Co.

Interpolyamide. No. 2,285,009. Merlin M. Brubaker, William E. Hanford and Richard H. Wiley to E. I. du Pont de Nemours & Co.

Polyamides combined with cellulose derivatives. No. 2,285,178. Kurt Thinius to Deutsche Celluloidfabrik Aktiengesellschaft.

Artificial resin product comprising reaction product of water-soluble slightly acid-reacting degraded protein with a phenol and an aldehyde. No. 2,285,193. Lloyd E. Dimond and William L. Hicks to Carl Marx.

Coumarone-indene resin. No. 2,285,416. Frank W. Corkery and Ralph H. Bailey to Pennsylvania Industrial Chem. Corp.

Coumarone-indene resin. No. 2,285,417. Frank W. Corkery to Pennsylvania Industrial Chemical Corp.

Composition of matter comprising a condensation product of ingredients comprising a urea, an aliphatic aldehyde and a chlorinated acetamide. No. 2,285,418. Gaetano F. D'Alelio to General Electric Co.

Composition of matter essentially composed of a vinyl resin intimately associated with an acylated ricinoleic acid ester of one of the group consisting of alkylene and polyalkylene glycol monoaryl and monoalkyl ethers. No. 2,285,420. Arthur K. Doolittle to Carbide & Carbon Co.

Manufacture of molding compounds. No. 2,285,501. Alfred Dixon and Raymond Lutz to Western Electric Co. Inc.

Elastic extensible plastic composition comprising a solvent-swellable co-polymer of styrene and an unsaturated ester containing at least two olefinic linkages, and at least about 50% by weight thereof of a compatible plasticizing agent. No. 2,285,562. Edgar Britton and Jean Zemba to The Dow Chemical Co.

Composite container comprising an outer body of formaldehyde-urea resin having an undercut recess in its inner wall, a liner of metal foil, and an inner shell of a water-resistant thermoplastic resin formed into place, the material of said inner shell extending into such undercut recess in the wall of said outer body. No. 2,285,614. James Rodgers, Jr., and Charles Slaughter to Plaskon Co. Inc.

Resinous materials. No. 2,285,797. August Bellefontaine and Hanns Bernard and Albert Sieberg.

Plastic sealing composition. No. 2,286,018. Floyd Smith.

Cellulose acetate molding composition. No. 2,286,041. Raphael Stern to Hercules Powder Co.

Method of making tubes of pyroxylin material of the like. No. 2,286,045. John Whitehouse.

Rubber

Rubber having incorporated therein, prior to vulcanization, an accelerator of the group consisting of 2-mercapto-thiazolines and metal salts thereof in which the valences of the metals are satisfied by 2-mercapto-thiazoline radicals only, as a primary accelerator, and an accelerating derivative of a dithiocarbamic acid, as a secondary accelerator, there being from about 1 to about 100 parts of the primary accelerator to each part of the secondary accelerator. No. 2,283,334. Arthur Neal and Bernard Sturgis to E. I. du Pont de Nemours & Co.

Rubber having incorporated therein, prior to vulcanization, an accelerator of the group consisting of 2-mercapto-thiazolines and metal salts thereof in which the valences of the metals are satisfied by 2-mercapto-thiazoline radicals only, as a primary accelerator, and an accelerating acyl derivative of a dithiocarbamic acid, wherein the acyl radical is attached through the sulfhydryl sulfur of the dithiocarbamic acid, as a secondary accelerator, there being from about 1 to about 50 parts of the primary accelerator to each part of the secondary accelerator. No. 2,283,335. Arthur Neal and Bernard Sturgis to E. I. du Pont de Nemours & Co.

Rubber having incorporated therein, prior to vulcanization, an accelerator of the group consisting of 2-mercapto-thiazolines and metal salts thereof in which the valences of the metals are satisfied by 2-mercapto-thiazoline radicals only, as a primary accelerator, and an accelerating metal salt of a dithiocarbamic acid, as a secondary accelerator, there being from about 1 to about 100 parts of the primary accelerator to each part of the secondary accelerator. No. 2,283,336. Arthur Neal and Bernard Sturgis to E. I. du Pont de Nemours & Co.

Rubber having incorporated therein, prior to vulcanization, an accelerator of the group consisting of 2-mercapto-thiazolines and metal salts thereof in which the valences of the metals are satisfied by 2-mercapto-thiazoline radicals only, as a primary accelerator, and an accelerating ester of a dithiocarbamic acid, as a secondary accelerator, there being from about 1.5 to about 25 parts of the primary accelerator to each part of the secondary accelerator. No. 2,283,337. Arthur Neal and Bernard Sturgis to E. I. du Pont de Nemours & Co.

Rubber having incorporated therein, prior to vulcanization, an accelerator of the group consisting of 2-mercapto-thiazolines and metal salts thereof in which the valences of the metals are satisfied by 2-mercapto-thiazoline radicals only, as a primary accelerator, and an accelerating substituted ammonium salt of a dithiocarbamic acid, as a secondary accelerator, there being from about 1 to about 100 parts of the primary accelerator to each part of the secondary accelerator. No. 2,283,342. Bernard Sturgis to E. I. du Pont de Nemours & Co.

Method of preserving rubber which comprises incorporating therein a 4-phenylamino 1-alkyl 1, 2-dihydrobenzofurane. No. 2,283,388. Philip Paul and Louis Howland to United States Rubber Co.

Method making sponge rubber. No. 2,283,604. Marion M. Harrison to The B. F. Goodrich Co.

Process vulcanizing rubber in presence of compound selected from class consisting of 2-mercapto-oxazolines having no substituents on the ring other than hydrocarbon groups, and salts thereof. No. 2,283,747. Roger A. Mathes to The B. F. Goodrich Co.

Synthetic rubberlike materials from 1-cyanobutadiene, 1, 3 and 2-chlorobutadiene-1, 3. No. 2,284,280. Bernard J. Habgood, Elias Isaacs and Leslie B. Morgan to Imperial Chemical Industries, Ltd.

Additional Patents on Rubber and Textiles for above volumes will be given next month.

Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. Your comments and criticisms will be appreciated.

Granted and Published August 12, 1941.

Manufacture of alkaline caustic solution for digesting cellulosic material. No. 398,530. Horace Freeman and Theron Carpenter.

Method of extracting nickel or cobalt by the direct oxidation of their sulfides in an aqueous solution containing a hypochlorite. No. 398,541. Alan Kissock.

A composite thread composed of rubber thread associated with sized and set crepe textile yarn or rayon silk and the like. No. 398,553. Thomas L. Shepherd.

Process of effecting a desired separation of a mixture of dry material particles of different natures into a plurality of different portions. No. 398,560. Edwin L. Wiegand.

Stabilized diazo compounds having the general formula R-Gx in which R is a radical of an ice color diazo component, G is a radical of a guanyl-urea free from substituents capable of azoic coupling included in the group consisting of guanyl-urea-N-sulfonic acids, N-nitro-guanyl-ureas and their salts, and x is 1 or 2. No. 398,564. American Cyanamid Company. (Robert P. Parker).

Preparation for medicinal use for the treatment of arthritis and fibrositis comprising a bile pigment and one of the class consisting of bile acids and salts of bile acids. No. 398,566. Armour and Company. (Bernard L. Wyatt and Harry E. Thompson).

Process for producing alpha cellulose from hardwood. No. 398,573. Board of Regents of the University of Minnesota. (Lew W. Cornell and Ralph E. Montonna).

Adsorber for removing vapors from mixtures thereof with air comprising a circular shell and a quadrangular bed of adsorbent disposed therein coaxial with said shell. No. 398,583. Carbide and Carbon Chemicals, Limited. (Leonard A. Logan).

Adsorber for removing fluids from other fluids by adsorption comprising a basket of corrosion resisting material holding the adsorbent material and disposed in spaced relationship with respect to the shell or casing of the adsorber. No. 398,584. Carbide and Carbon Chemicals, Limited. (Leonard A. Logan).

Method of producing bauxite impregnated with coke. No. 398,585. Chemical Construction Corporation. (Blakeslee Barnes).

Process of rapidly extracting protein from oleaginous seed material. No. 398,588. The Drackett Company. (James N. Lawrence and Russell H. Hieronymus).

Method of melting magnesium and magnesium base alloys in induction furnaces provided with a siliceous lining. No. 398,607. Magnesium Elektron, Limited. (Adolf Beck, Hermann Schunck and Günther Ostermann).

Metallurgical flux composed of separate relatively hard water-resistant pellets each comprising finely divided fluorspar agglomerated with the residue resulting from drying a mixture of the fluorspar and tall oil. No. 398,608. Mahoning Mining Company. (Frederick C. Abbott and Carl O. Anderson).

Apparatus for the extraction of fibers from cellulosic material. No. 398,621. Pomilio Corporation Limited. (Umberto Pomilio).

Apparatus for continuous treatment of vegetable fibers at an elevated temperature and elevated pressure with a chemical solution. No. 398,622. Pomilio Corporation Limited. (Ottorino Pomilio and Umberto Pomilio).

Process of producing vanillin comprising treating isoeugenol with a solution of hydrogen peroxide in the presence of a catalyst selected from the group consisting of the oxides of osmium, ruthenium, vanadium, chromium, and molybdenum. No. 398,627. Research Corporation. (Nicholas A. Miles).

Process in which aqueous nitric acid is mixed with a metal chloride and the reaction mixture thus obtained is heated to evolve nitrosyl chloride and chlorine and form a solution of a nitrate by reaction of the nitric acid and metal chloride. No. 398,630. The Solvay Process Company. (Herman A. Beekhuis, Jr.).

Process for the production of a metal nitrate and chlorine which comprises partially oxidizing nitrosyl chloride to form a mixture of nitrogen peroxide, chlorine and residual unoxidized nitrosyl chloride. No. 398,631. The Solvay Process Company. (Herman A. Beekhuis, Jr.).

Process for the production of chlorine and a metal nitrate by reacting a metal chloride with nitric acid to form metal nitrate and a gaseous mixture of nitrosyl chloride and chlorine. No. 398,632. The Solvay Process Company. (Herman A. Beekhuis, Jr.).

Process for the refining of fatty matter in a continuous, multi-stage countercurrent manner. No. 398,634. Shell Development Company. (Walter J. Hund and Donald H. Rowe).

Micro-biological method of ground exploration comprising collecting a sample of the soil and analyzing it for the presence of hydrocarbon-consuming bacteria. No. 398,635. Shell Development Company. (Gerald L. Hassler).

Method and apparatus for cutting and collecting staple fibers. No. 398,663. Henry Dreyfus. (William I. Taylor and Alfred Herbert).

Method of cutting and collecting staple fiber comprising cutting staple fiber from continuous filaments and removing the fibers from the cutting point by suction applied in such way as to discharge the fibers below the level of a liquid. No. 398,664. Henry Dreyfus. (William I. Taylor and Leslie B. Gibbons).

Process for the preparation of isoquinoline compounds which act on the central nervous system. No. 398,667. Fritz Külz and Carl A. Hornung.

Method of purifying continuously suspensions or sludges, especially fibrous pulps as used in the paper industry. No. 398,668. Helmuth Banning.

Hygienic bandage comprising absorbent material enclosed in a wrapper comprising cellulose hydrate foil treated to make it non-rustling. No. 398,670. Johannes Hildner.

Method and apparatus for cold-working roundish metal bars by twisting. No. 398,671. Ernst Lukacs.

Granted and Published August 19, 1941.

Process for the production of equine encephalomyelitis vaccine comprising infecting living fowl embryo tissue with the infectious virus of equine encephalomyelitis, propagating the virus in the tissue, and inactivating the virus so propagated without substantially destroying the immunizing capacity of the resulting vaccine. No. 398,676. Joseph W. Beard.

Process of reducing ore to metal comprising maintaining a violently turbulent and upwardly flowing column of reducing gases in a furnace shaft, introducing pulvurulent ore and a reducing agent into the column of gases, regulating the velocity of the gases so as to carry the ore upwardly and maintain it in suspension until it is reduced to metal, maintaining the temperature of the gases below the fusion point of the metal, and separating the metal from the gases. No. 398,674. Frank Hodson and Paul A. Hirsch.

The process of preparing diesters of unsaturated glycols which comprises reacting a fatty acid chloride having twelve to eighteen carbon atoms with an alkali metal while in an inert solvent for the fatty acid chloride. No. 398,699. Armour and Company. (Anderson W. Ralston and William M. Selby).

An acylated styrene in which the aliphatic hydrocarbon radical of the acyl group contains at least eleven carbon atoms. No. 398,700. Armour and Company. (Anderson W. Ralston and Robert J. Vander Wal).

Aliphatic polyamines prepared by hydrogenating a polymerized aliphatic nitrile, the polymerized nitrile having at least two nitrile radicals and being the product of polymerizing an aliphatic nitrile having at least ten carbon atoms. No. 398,701. Armour and Company. (Anderson W. Ralston and Robert J. Vander Wal).

Element intended for internal heating while immersed in a bath of molten metal or metal to be melted. No. 398,702. Austin Motor Company, Limited. (John J. Sheehan).

Method for the preparation of a metallo-organic compound of titanium which comprises subjecting to double decomposition an alkaline earth metal gluconate and a titanium sulfate solution. No. 398,703. Canadian Titanium Pigments, Limited. (Walter K. Nelson).

Gasket material comprising about 71-24% by weight shredded cork and about 5-20% by weight filler, both embodied in 24-71% polymerized chloroprene, the cork being employed to give the material resiliency and consolidated into a resilient mass capable of retaining its resiliency under pressure. No. 398,704. Canadian Westinghouse Company Limited. (William B. Atkins).

Non-corrosive anti-freeze liquid composition comprising an alcohol and an inhibitor essentially composed of a soluble salt of an acid of the structural formula R—CH=CH—COOH in which R. represents an organic radical of the group consisting of alkyl, phenyl, and furyl. No. 398,718. Carbide and Carbon Chemicals Limited. (Headlee Lamprey).

Non-corrosive anti-freeze liquid comprising an alcohol as the freezing point depressant and an inhibitor containing as the essential corrosion preventive a soluble chlorate salt in an amount of about 0.10% to 1.00% by weight of the alcohol. No. 398,719. Carbide and Carbon Chemicals Limited. (Headlee Lamprey).

Method of producing light-diffusing coating on the interior or hollow glass articles. No. 398,722. Corning Glass Works. (Herbert S. Willson)

Method of forming a web of staple fiber by cutting a bundle of parallel continuous filaments into staple lengths of at least two and a quarter inches, and then, while maintaining the parallelism of the filaments, passing them through a gilling device, and then, without any intermediate treatment or storage, through a set of drafting rollers. No. 398,723. Courtaulds Limited. (Harold Ashton and William Hardacre).

Monoazo dyestuffs, dyeing wool and silk in yellow shades and having good fastness to alkaline and acid fulling and to sea-water. No. 398,727. J. R. Geigy A. G. (Achille Conzetti).

Foreign Chemical Patents

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Diazo dyestuffs being dark powders soluble in water, with violet to reddish blue color, dyeing animal fibers in an acid bath violet to reddish blue shades of good fastness to light and fulling. No. 398,728. J. R. Geigy A. G. (Adolf Krebser).

Process of preparing processed cheese which consists in melting the cheese to a homogeneous mass at a pasteurizing temperature in the presence of a cheese stabilizing salt which consists of a soluble complex sodium-alkaline-earth phosphate. No. 398,730. Hall Laboratories, Inc. (Fritz Draisbach).

Process of nitrating methane which includes producing contact between methane and nitric acid in the vapor phase at a temperature within the range of about 375°C. to about 550°C., the time of contact at reaction temperature being within the range of about 1.0 second at about 375°C. to about 0.005 second at about 550°C. No. 398,733. Hercules Powder Company. (George K. Landon).

Foam stabilizing composition comprising an aqueous solution of hydrolysis products obtained by hydrolizing a protein solution, said products containing at least 25% of their nitrogen content in the form of peptones. No. 398,751. Pyrene Minimax Corporation. (Arthur F. Ratzer).

Method of treating cellulosic material such as textile fibers to remove therefrom the lesser celluloses such as the sugars, glucosides and other impurities without dissolving the alpha cellulose. No. 398,752. Ridbo Laboratories, Inc. (William A. Bodenschatz and Eric O. Ridgway).

Method of treating cellulosic material such as textile fibers to remove therefrom the lesser celluloses such as the sugars, glucosides and other impurities without dissolving the alpha cellulose. No. 398,753. Ridbo Laboratories, Inc. (William A. Bodenschatz and Eric O. Ridgway).

Process for increasing the moisture content of a continuously moving strip of paper. No. 398,754. J. O. Ross Engineering Corporation. (Alvin E. Montgomery).

Process of saponifying textile materials containing an organic ester of cellulose by subjecting the fabric to a saponifying bath containing a saponifying agent and pine oil. No. 398,761. Camille Dreyfus. (Cyril M. Croft).

Process for refining phenols especially from oils, extracts and tarry liquors of lignite tar, from crude tar acids, the fractions thereof, and the like. No. 398,763. Deutsche Erdöl-Aktiengesellschaft. (Friedrich Schick and Helmut Schramm).

Stable, moth-proofing solution containing triethanolamine silicofluoride, aluminum sulfate, and a sulfated primary alcohol having from 12 to 22 carbon atoms, said solution being substantially free of uncombined silicic acid. No. 398,764. Merck & Co., Inc. (William H. Engels and John Weijlard).

Process for producing monovinyl acetylene which comprises passing acetylene through a liquid-free solid catalyst bed containing a cuprous salt, a water-soluble salt of another metal selected from the first, second and third groups of the periodic table, and a material selected from the group consisting of basic-nitrogen compounds and organic compounds containing a plurality of hydroxyl groups. No. 398,765. Dr. Alexander Wacker Gesellschaft fur Elektrochemische Industrie G.m.b.H. (Herbert Berg, Hans Heim and Franz Leiss).

Granted and Published August 26, 1941.

Parting compound comprising powdered English walnut shells impregnated with water-proofing material. No. 398,770. Peter J. Weber and Charles F. Witters.

Process of coloring textile material or film comprising a synthetic resin which comprises applying thereto for forming therein an unsulfonated substantially water-insoluble dyestuff. No. 398,779. Henry Dreyfus.

Surgical dressing comprising yarns, filaments or fibers of at least partially saponified organic esters of cellulose. No. 398,780. Camille Dreyfus.

Method of setting zinc sheets for use in photoengraving. No. 398,790. Thomas Jerome Masse.

Electrostatic apparatus for particle classification and separation of ore. No. 398,800. Edwin L. Wiegand.

Insecticide comprising precipitated sodium aluminum fluoride having a bulk density, as precipitated, of over 75 cubic inches per pound. No. 398,808. Aluminum Company of America. (John E. Morrow).

Sewing thread comprising filaments composed of a synthetic linear polyamide having a melting point in the range of 180-275°C. No. 398,823. Canadian Industries, Limited. (Alexis Sommaripa).

Composite electrode comprising a layer of calcium tungstate adapted to be excited to fluorescence by the action of impinging radiations and a transparent film of oxidized silver thereon, said film being photoelectrically activated with caesium, whereby fluorescence of the calcium tungstate layer results in electron emission from the electrode. No. 398,824. Canadian General Electric Company, Limited. (Irving Langmuir).

Process of making a molded straw board comprising shredding the straw to about an average of one inch in length, then digesting said shredded straw without chemicals under about 15 pounds per square inch steam pressure for about two hours without completely softening said straw, then double refining the digested straw in attrition type mills at consistencies of 10% and 4-5% respectively, then forming the refined straw into board, and drying said board. No. 398,828. Canadian Gypsum Company, Limited. (Joseph W. Gill).

Process for producing a more highly condensed polymer from a lower molecular weight polyamide obtained from approximately equimolecular proportions of diamine and dibasic acid which comprises heating said polyamide at polymerizing temperature below its melting point under conditions permitting escape of the by-product of the condensation reaction, and continuing such heating until said more highly condensed polymer is formed. No. 398,830. Canadian Industries, Limited. (Paul J. Flory).

Process comprising hydrogenating a resinous polymer of dihydronaphthalene. No. 398,831. Canadian Industries, Limited. (Harold Stephens Holt).

Process for the manufacture of a flame resisting plasticizer which comprises treating the reaction product obtained by reacting castor oil and a polycarboxylic acid with a free halogen until an increase of 5 to 25 per cent by weight is obtained. No. 398,932. Canadian Industries, Limited. (Arthur Hill).

Textile assistant comprising an a-a' diether of glycerine and an aliphatic branched chain primary alcohol having at least six carbon atoms. No. 398,833. Canadian Industries, Limited. (Norman D. Scott).

Process for the production of coated fabrics including a flame resisting coating comprising colloided nitrocellulose. No. 398,834. Canadian Industries, Limited. (John H. McGill).

Process for the production of amines which comprises catalytically hydrogenating epsilon-caprolactan at a temperature between about 200 and 400°C. No. 398,835. Canadian Industries, Limited. (Wilbur A. Lazier and George W. Rigby).

Process of treating a crude olefin-sulfur dioxide resin obtained by reacting sulfur dioxide with a butene comprising digesting the resin in finely divided form for a prolonged period at a temperature of 5-60°C. in a digesting mixture comprising methanol and methylene chloride. No. 398,836. Canadian Industries, Limited. (Jesse Harmon).

Process which comprises polymerizing a mixture of 2-chlorobutadiene-1,3 and 1-cyanobutadiene-1,3. No. 398,837. Canadian Industries, Limited. (Bernard J. Habgood, Elias Isaacs and Leslie B. Morgan).

Blasting explosive composition capable of maintaining after packaging a bulky density below 0.75 grams/cc and sensitive to initiation by a commercial detonator. No. 398,938,. Canadian Industries Limited. (Vernon H. Williams).

Pigment mixing apparatus. No. 398,839. Canadian Industries, Limited. (Marion A. Dibble, Gordon R. McCormick and Rollo G. Russell).

Process for the manufacture of 1-cyanobutadiene-1,3 which comprises heating an ester of croton-aldehydecyanohydrin to thermal decomposition temperature. No. 398,840. Canadian Industries, Limited. (Herbert Gudgeon).

Process of coating surfaces with a cellulose derivative lacquer which comprises applying to said surface at a liquid temperature of approximately 50°C. a cellulose derivative lacquer having a concentration of solid components 35-50% higher than the optimum concentration for application at approximately 25°C. No. 398,848. Commercial Solvents Corporation. (Charles Bogin).

Process for refining starch converted dextrose solutions which comprises subjecting the solution to a flash cooling operation under vacuum to reduce the temperature of the solution below the melting point of fatty acids and to extract water from the solution, and then subjecting the solution to mechanical filtration for the purpose of removing congealed fatty acids. No. 398,849. Corn Products Refining Company. (Edgar H. Williams).

Process of drying starch in a moist but non-fluent state without substantial gelatinization of the starch which comprises subjecting the starch cake to a milling operation which reduces it to a finely divided state, and simultaneously subjecting the starch in this state to contact with a stream of drying gas from a source outside the process and heated to a temperature above the gelatinizing temperature of the starch to instantaneously remove the major portion of the mixture. No. 398,850. Corn Products Refining Company. (Anthony C. Horesi).

Method of detecting the presence of carbon dioxide in a sample of gas which comprises placing the sample in contact with a solution capable of absorbing carbon dioxide to an extent proportional to the concentration of carbon dioxide in the sample and thereby altering in light transmitting power, passing a beam of light through a portion of the solution, and detecting variations in the character of the transmitted beam of light. No. 398,853. Dominion Oxygen Company, Limited. (John N. Burdick).

Acetylene generator adapted to use run-of-crusher carbide. No. 398,854. Dominion Oxygen Company, Limited. (James G. Marshall and Chester A. Siver).

Method of making a protected battery plate which comprises packing a battery grid with electrochemically active paste, surrounding the packed grid with a covering of perforated vulcanized hard rubber composition, placing the assembly in a flexible air tight bag, exhausting the air from said bag, and applying heat thereto. No. 398,855. Dominion Rubber Company, Limited. (Alexis W. Keen).

Method for the molding of a pasty sponge mass comprising essentially an intimate mixture of viscose, fibrous material and pore-forming material, said solid material being subject to objectionable orientation when said mass is forced along a continuous surface. No. 398,857. E. I. du Pont de Nemours & Co., Inc. (Thomas F. Banigan and Omar E. Snyder).

Insulating enamel having approximately the following composition by weight; wood rosin, 50 parts, alkyd resin 150 parts, perilla oil 203.5 parts, fish oil 15 parts, chinawood oil 73.5 parts, manganese resinate 0.3 part, ferrous resinate 0.45 part, cobalt acetate 0.25 part and zinc resinate 1 part. No. 398,858. E. I. du Pont de Nemours & Co., Inc. (Frederick J. Emig).

Delay detonator wherein the delay element is charged with a delay composition of predetermined burning speed consisting of an oxidizing agent and a metal component comprising an alloy of antimony with at least one metal whose heat of combustion per unit volume is substantially different from that of antimony. No. 398,859. E. I. du Pont de Nemours & Co., Inc. (Lawton A. Burrows and Walter E. Lawson).

Process of controlling the operation of a converter providing a reaction chamber containing a contact mass utilized in alternate periods of endothermic and exothermic reactions, as in the transformation of hydrocarbons and subsequent regeneration of the contact mass, characterized by admitting the fluid reactants for each period of the cycle to a manifolding zone adjacent the reaction chamber at such temperature or temperatures as to maintain the intervening wall at a substantially constant temperature. No. 398,866. Houdry Process Corporation. (Eugene J. Houdry and Thomas B. Prickett).

Process of printing cellulosic textile materials in resist style to produce white patterns on a colored ground. No. 398,868. Imperial Chemical Industries, Limited. (Denys P. Millburn).

Process comprising polymerizing a mixture of 1-cyanobutadiene-1,3 and a member of the group comprising butadiene-1,3 and 2,3-dimethylbutadiene-1,3. No. 398,869. Imperial Chemical Industries, Limited. (Bernard J. Habgood, Elias Isaacs and Leslie B. Morgan).

Additional Canadian Patents Granted and Published August 26, 1941 will be given next month.

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